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Federal Communications Commission  
Washington, D.C. 20554

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In the Matter of )

Amendment of Parts 2, 25, and 87 of the  
Commission's Rules to Implement Decisions from  
World Radiocommunication Conferences  
Concerning Frequency Bands Between 28 MHz  
and 36 GHz and to Otherwise Update the Rules in  
this Frequency Range )

ET Docket No. 02-305

Amendment of Parts 2 and 25 of the  
Commission's Rules to Allocate Spectrum For  
Government and Non-Government Use in the  
Radionavigation-Satellite Service )

RM-10331

**REPORT AND ORDER****Adopted: October 31, 2003****Released: November 4, 2003**

By the Commission:

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## INTRODUCTION

1. By this action, we amend Parts 2, 25, and 87 of our Rules to implement domestically various allocation decisions from several World Radiocommunication Conferences ("WRCs") concerning the frequency bands between 28 MHz and 36 GHz, and to otherwise update our Rules in this frequency range. The following actions are the most significant to non-Federal Government operations: (1) implementation of generic mobile-satellite service ("MSS") allocations in the bands 1525-1559 MHz and 1626.5-1660.5 MHz ("L-band"); (2) allocation of the band 1164-1215 MHz to the radionavigation-satellite service ("RNSS"); (3) deletion of unused and limited fixed-satellite service ("FSS") and broadcasting-satellite service ("BSS") allocations from the band 2500-2690 MHz; and (4) upgrade of the Earth exploration-satellite service ("EESS") allocation in the band 25.5-27 GHz from secondary to primary. In addition, at the request of the National Telecommunications and Information Administration ("NTIA"), we implement various allocation changes for the space science services and the inter-satellite service ("ISS"), most of which involve spectrum primarily used by the Federal Government.<sup>1</sup> These actions conform our Rules to previous WRC decisions and are expected to provide significant benefits to the American public.

## EXECUTIVE SUMMARY

2. In this Report and Order ("R&O"), we provide for generic MSS allocations across all of the frequencies in the bands 1525-1559 MHz and 1626.5-1660.5 MHz. Specifically, we expand the primary allocation in the bands 1545-1549.5 MHz, 1558.5-1559 MHz, 1646.5-1651 MHz, and 1660-1660.5 MHz from the aeronautical mobile-satellite (route) service ("AMS(R)S") to all services within the MSS while preserving the status of AMS(R)S. The effect of this action is that the bands 1545-1559 MHz and 1646.5-1660.5 MHz will be made available to all types of MSS communications on a primary basis, rather than segmented for specialized use. This action permits more efficient use of this radio spectrum and facilitates the expansion of MSS use globally. In addition, we delete the existing primary maritime mobile-satellite service ("MMSS") and MSS allocations in the bands 1530-1544 MHz and 1626.5-1645.5 MHz, as they would now be superfluous. We also delete the secondary allocation for aeronautical telemetry from the band 1525-1535 MHz to remove potentially conflicting allocations.

3. We allocate the band 1164-1215 MHz to the RNSS for space-to-Earth ("downlink") and space-to-space transmissions in order to accommodate a new civil global positioning system ("GPS") signal.<sup>2</sup> This action permits the addition of GPS signal "L5," which supports the safety-of-life requirements demanded by civil aviation. We also allocate the bands 1215-1240 MHz and 1559-1610 MHz, which are currently limited to RNSS downlinks, for RNSS space-to-space transmissions as well. This action allows use of spaceborne RNSS receivers for scientific and commercial applications.

4. We delete the flight test and radiolocation allocations in the band 2320-2345 MHz because of the potential for conflict between these services and the Satellite Digital Audio Radio Service ("Satellite DARS"), which has been brought into operation in this band. We also delete the unused FSS

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<sup>1</sup> The Commission, which is an independent agency, administers non-Federal Government spectrum and NTIA, which is an operating unit of the Department of Commerce, administers Federal Government spectrum. See 47 C.F.R. § 2.105(a). NTIA also approves the spectrum needs of new systems for use by Federal departments and agencies and maintains the Federal Government Table of Frequency Allocations in its *Manual of Regulations and Procedures for Federal Radio Frequency Management* ("NTIA Manual").

<sup>2</sup> RNSS is a radiocommunication service for the purpose of radiodetermination involving the use of one or more space stations. This service may also include feeder links necessary for its own operation. Radiodetermination is the determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves. See 47 C.F.R. § 2.1.

and BSS allocations from the band 2500-2690 MHz in order to remove allocations that are not compatible with two-way fixed and mobile operations that are operating and anticipated in the band.

5. We further implement domestically various allocation decisions from several WRCs concerning the space science services and the ISS. In this regard, we take the following actions:

- Revise secondary allocations for the Federal Government EESS<sup>3</sup> and the Federal Government space research service (“SRS”)<sup>4</sup> from secondary to primary status in 950 megahertz of spectrum in eight frequency bands and specify that these allocations are to be used for active sensor operations (“EESS (active)” and “SRS (active)”):<sup>5</sup> 5250-5255 MHz, 5255-5350 MHz, 8550-8650 MHz, 9500-9800 MHz, 13.4-13.75 GHz, and 17.2-17.3 GHz.
- Modify the non-Federal Government/Federal Government shared allocations at 13.25-13.4 GHz and 35.6-36 GHz to provide flexibility for the Federal Government to use 550 megahertz of additional spectrum for EESS (active) and SRS (active) on a primary basis, and change the primary footnote allocation for active spaceborne sensors in the band 35.5-35.6 GHz to a direct Table listing.
- Modify the non-Federal Government/Federal Government shared allocation at 5350-5460 MHz to provide flexibility for the Federal Government to use 110 megahertz of additional spectrum for the EESS (active) on a primary basis.
- Modify the non-Federal Government/Federal Government shared allocation at 401-403 MHz to provide flexibility for the Federal Government to use EESS uplinks and meteorological-satellite service (“METSAT”) uplinks on a primary basis.<sup>6</sup>
- Modify the non-Federal Government/Federal Government shared allocation at 410-420 MHz to provide flexibility for the Federal Government to use the SRS on a primary basis for space-to-space transmissions.
- Modify the non-Federal Government/Federal Government shared allocation at 7750-7850 MHz to provide flexibility for the Federal Government to use METSAT downlinks on a primary basis, limited to non-geostationary satellite systems.
- Modify the non-Federal Government/Federal Government shared allocation at 8400-8450 MHz to provide flexibility for the non-Federal Government to use SRS downlinks from deep space on a secondary basis.
- Modify the non-Federal Government/Federal Government shared allocation at 25.25-27.5 GHz to provide flexibility for the Federal Government to use the ISS on a primary basis.
- Revise the EESS allocation from secondary to primary status in the band 25.5-27 GHz and change the directional indicator from space-to-space to space-to-Earth.

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<sup>3</sup> EESS is a radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which (1) information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active or passive sensors on Earth satellites; (2) similar information is collected from airborne or Earth-based platforms; (3) such information may be distributed to earth stations within the system concerned; and (4) platform interrogation may be included. This service may also include feeder links necessary for its operation. *See* 47 C.F.R. § 2.1.

<sup>4</sup> SRS is a radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes. *See* 47 C.F.R. § 2.1.

<sup>5</sup> An active sensor is an EESS or SRS measuring instrument in which information is obtained by transmission and reception of radio waves. *See* 47 C.F.R. § 2.1.

<sup>6</sup> The meteorological-satellite service is an EESS used for meteorological purposes. *See* 47 C.F.R. § 2.1.

6. In addition, we: (1) delete the primary ISS shared allocation from the band 32-32.3 GHz; (2) delete the secondary AMS(R)S allocation from the band 136-137 MHz; (3) more than double the size of the geographic area in New Mexico and Texas where amateur stations in the band 420-450 MHz will be limited in power and where spread spectrum radiolocation systems in the sub-band 420-435 MHz should not expect to be accommodated; (4) modify our rules to reflect NTIA's recent action, which specified that Federal Government wind profiler radars ("WPRs")<sup>7</sup> will operate in the sub-band 448-450 MHz; (5) permit U.S. flagged ships to use more spectrum-efficient equipment for on-board mobile radiotelephony communications in areas outside the territorial waters of the United States; (6) delete unused allocations for the International Fixed Public Radiocommunication Services ("IFPRS") from the bands 2.1-2.2 GHz and 10.7-11.7 GHz; and (7) allocate the band 14-14.5 GHz to the MSS (Earth-to-space), which includes aeronautical mobile-satellite service ("AMSS"), on a secondary basis. We also make numerous ministerial amendments to Part 2 of our Rules.

### DISCUSSION

7. In response to various petitions for rulemaking, the Commission has addressed in a number of proceedings many allocation changes that resulted from the 1992 World Administrative Radio Conference ("WARC-92") and the 1995 and 1997 World Radiocommunication Conferences ("WRC-95" and "WRC-97").<sup>8</sup> In the *Notice of Proposed Rule Making* ("Notice") in this proceeding, the Commission turned to additional allocation changes from these conferences that have not previously been considered, including several changes sought mainly at the request of NTIA.<sup>9</sup> The *Notice* also addressed the RNSS allocation changes from the 2000 World Radiocommunication Conference ("WRC-2000"),<sup>10</sup> a Petition for Rule Making filed by the Lockheed Martin Corporation ("Lockheed Martin") requesting that the WRC-2000 RNSS allocations in the bands 1164-1215 MHz and 1559-1610 MHz be implemented domestically and that these frequency bands be added to Part 25 of the Commission's Rules,<sup>11</sup> and some non-WRC allocation issues that concern the frequency bands between 28 MHz and 36 GHz. These issues included downgrading the primary flight test and radiolocation allocations in the band 2320-2345 MHz to secondary status, deleting the limited BSS and FSS allocations from the band 2500-2690 MHz, deleting unused IFPRS allocations from the bands 2.1-2.2 GHz and 10.7-11.7 GHz, and making various ministerial amendments to clean up and update the Rules.

#### A. Generic MSS at L-Band

8. *Background.* In the United States, the bands 1530-1544 MHz (downlinks) and 1626.5-1645.5 MHz (uplinks) are allocated to the MMSS and the MSS on a co-primary basis.<sup>12</sup> Through its

<sup>7</sup> WPRs use sensitive Doppler radar to measure wind speed and direction at a variety of altitudes.

<sup>8</sup> See *Final Acts of the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (WARC-92)*, Malaga-Torremolinos, 1992 ("*WARC-92 Final Acts*"); *Final Acts of the World Radiocommunication Conference (WRC-95)*, Geneva, 1996 ("*WRC-95 Final Acts*"); and *Final Acts of the World Radiocommunication Conference (WRC-97)*, Geneva, 1997 ("*WRC-97 Final Acts*").

<sup>9</sup> See *Notice of Proposed Rule Making*, ET Docket No. 02-305, 17 FCC Rcd 19756 (2002).

<sup>10</sup> See *Final Acts of the World Radiocommunication Conference (WRC-2000)*, Istanbul, 2000 ("*WRC-2000 Final Acts*").

<sup>11</sup> See Lockheed Martin Petition for Rule Making, September 28, 2001. This petition was designated as RM-10331 and placed on public notice on November 15, 2001. See Rep. No. 2512.

<sup>12</sup> See Table, *infra*, which follows ¶ 20.

adoption of footnote US315,<sup>13</sup> the Commission requires that MMSS distress and safety communications have priority access and real-time preemptive capability in these bands over MSS routine, non-safety related public correspondence.<sup>14</sup> In addition, the band 1525-1530 MHz is allocated to the MSS on a primary basis and the band 1525-1535 MHz is allocated to the mobile service on a secondary basis, limited to aeronautical telemetry. Footnote US78 states, *inter alia*, that permissible use of the frequency 1525.5 MHz includes telemetry associated with launching and reentry into the Earth's atmosphere, as well as any incidental orbiting prior to reentry, of "manned objects" undergoing flight tests.<sup>15</sup> Together, the 1525-1544 MHz and 1626.5-1645.5 MHz bands are known as "lower L-band."

9. The bands 1544-1545 MHz (downlinks) and 1645.5-1646.5 MHz (uplinks) are allocated to the MSS on an exclusive primary basis. Through footnotes 5.356 and 5.375, the Commission requires that the use of these bands be limited to distress and safety communications.

10. The bands 1545-1559 MHz (downlinks) and 1646.5-1660.5 MHz (uplinks) are allocated to the AMS(R)S on a primary basis and are known as "upper L-band."<sup>16</sup> Most of upper L-band is also allocated to the MSS, as follows: the bands 1545-1549.5 MHz (downlinks) and 1646.5-1651 MHz (uplinks) are allocated on a secondary basis, and the bands 1549.5-1558.5 MHz (downlinks) and 1651-1660 MHz (uplinks) are allocated on a primary basis. Through its adoption of footnote US308, the Commission specifies that AMS(R)S requirements that cannot be accommodated in the dedicated AMS(R)S bands (1558.5-1559 MHz and 1660-1660.5 MHz) or in the secondary MSS bands (1545-1549.5 MHz and 1646.5-1651 MHz) have priority access and real-time preemptive capability over routine, non-safety related public correspondence in the primary MSS bands (1549.5-1558.5 MHz and 1651-1660 MHz).<sup>17</sup>

11. WRC-97 allocated the bands 1525-1559 MHz (downlinks) and 1626.5-1660.5 MHz (uplinks) to the MSS on a primary basis throughout the world.<sup>18</sup> The general structure of the MSS

<sup>13</sup> Footnote US315 reads as follows: In the frequency bands 1530-1544 MHz and 1626.5-1645.5 MHz maritime mobile-satellite distress and safety communications, e.g., GMDSS, shall have priority access with real-time preemptive capability in the mobile-satellite service. Communications of mobile-satellite system stations not participating in the GMDSS shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the mobile-satellite service. See 47 C.F.R. § 2.106.

<sup>14</sup> Public correspondence is any telecommunication which the offices and stations must, by reason of their being at the disposal of the public, accept for transmission. See 47 C.F.R. § 2.1.

<sup>15</sup> Footnote US78 reads as follows: "In the mobile service, the frequencies between 1435 and 1535 MHz will be assigned for aeronautical telemetry and associated telecommand operations for flight testing of manned or unmanned aircraft and missiles, or their major components. Permissible usage includes telemetry associated with launching and reentry into the Earth's atmosphere as well as any incidental orbiting prior to reentry of manned objects undergoing flight tests. The following frequencies are shared with flight telemetry mobile stations: 1444.5, 1453.5, 1501.5, 1515.5, 1524.5 and 1525.5 MHz." See 47 C.F.R. § 2.106, footnote US78.

<sup>16</sup> AMS(R)S is an aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes. See 47 C.F.R. § 2.106.

<sup>17</sup> Footnote US308 reads as follows: In the frequency bands 1549.5-1558.5 MHz and 1651-1660 MHz, the Aeronautical-Mobile-Satellite (R) requirements that cannot be accommodated in the 1545-1549.5 MHz, 1558.5-1559 MHz, 1646.5-1651 MHz and 1660-1660.5 MHz bands shall have priority access with real-time preemptive capability for communications in the mobile-satellite service. Systems not interoperable with the aeronautical mobile-satellite (R) service shall operate on a secondary basis. Account shall be taken of the priority of safety-related communications in the mobile-satellite service. See 47 C.F.R. § 2.106.

<sup>18</sup> See WRC-97 Final Acts at 27-32.

allocation emphasizes safety communications for MMSS in much of lower L-band through the adoption of footnote 5.353A and for AMS(R)S in upper L-band through the adoption of footnotes 5.357A and 5.362A.<sup>19</sup>

12. In February 2002, the Commission established licensing policies to govern MSS use of upper and lower L-bands.<sup>20</sup> Specifically, the Commission assigned up to 20 megahertz of the upper and lower L-band spectrum to Motient Services, Inc. (now Mobile Satellite Ventures Subsidiary, LLC or "MSV"), the only U.S. MSS system currently authorized in L-band. The Commission also incorporated into Part 25 of its Rules specific operational parameters and technical requirements to ensure that the integrity of maritime distress and safety communications will not be compromised by MSS operation in the lower L-band.<sup>21</sup>

13. *Proposals.* Domestically, the Commission has previously implemented generic MSS proposals in portions of the L-band. However, routine, non-safety related MSS public correspondence is currently precluded in the uppermost one megahertz of upper L-band spectrum (1558.5-1559 MHz and 1660-1660.5 MHz) and may be provided in nine megahertz of additional upper L-band spectrum only on a secondary basis (1545-1549.5 MHz and 1646.5-1651 MHz). Accordingly, the Commission proposed in the *Notice* to expand the permitted primary services from AMS(R)S to all MSS in the bands 1545-1549.5 MHz, 1558.5-1559 MHz, 1646.5-1651 MHz, and 1660-1660.5 MHz.<sup>22</sup>

14. In addition, the Commission proposed to take the following non-substantive, "clean-up" actions: (1) delete the superfluous MMSS allocations from bands 1530-1544 MHz and 1626.5-1645.5 MHz, (2) delete the superfluous secondary MSS allocations from the bands 1545-1549.5 MHz and 1646.5-1651 MHz, and (3) delete the superfluous AMS(R)S allocations from the bands 1549.5-1558.5 MHz and 1651-1660 MHz.<sup>23</sup> The effect of these proposals is that the band 1525-1559 MHz would be allocated for MSS downlinks on a primary basis and the band 1626.5-1660.5 MHz would be allocated for MSS uplinks on a primary basis.<sup>24</sup>

15. The Commission proposed to maintain footnotes US308 and US315 concerning the priority to be afforded distress and safety communications, stating that it believed that these generic MSS allocations would provide MSV and others with maximum flexibility, without hindering the use of this spectrum for distress and safety communications. The Commission requested comment on whether footnote US308 should be modified or replaced by international footnotes 5.357A<sup>25</sup> and 5.362A.<sup>26</sup> The

<sup>19</sup> See 47 C.F.R. § 2.106, footnotes 5.353A, 5.357A, and 5.362A.

<sup>20</sup> See *Establishing Rules and Policies for the use of Spectrum for Mobile Satellite Services in the Upper and Lower L-band*, IB Docket No. 96-132, *Report and Order*, FCC 02-24, released February 7, 2002 ("L-band Policy and Rules R&O").

<sup>21</sup> *Id.* at Appendix A, Section 25.136(d) and (e).

<sup>22</sup> *Notice* at 19763.

<sup>23</sup> Because the proposal referenced in the preceding paragraph is to expand AMS(R)S to all MSS in the bands 1545-1549.5 MHz and 1646.5-1651 MHz, AMS(R)S would also be deleted from those bands.

<sup>24</sup> *Notice* at 19763.

<sup>25</sup> Footnote 5.357A reads as follows: In applying the procedures of Section II of Article 9 to the mobile-satellite service in the bands 1545-1555 MHz and 1646.5-1656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article 44. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44 shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to,

Commission also proposed to update Part 25 of its Rules by stating that the bands 1525-1559 MHz and 1626.5-1660.5 MHz are available for use by L-band MSS systems and that use of the bands 1544-1545 MHz and 1645.5-1646.5 MHz is limited to distress and safety communications.<sup>27</sup>

16. The Commission also requested comment on whether the secondary mobile allocation, which is limited to aeronautical telemetry in the band 1525-1535 MHz, should be deleted in the United States Table of Frequency Allocations ("U.S. Table") and on whether co-frequency transmissions from aircraft can cause harmful interference to the MSS. Consistent with this proposal, the Commission also proposed to revise footnote US78 to remove the frequency 1525.5 MHz, which can be used for both aircraft and spacecraft telemetry.<sup>28</sup> The Commission further requested comment on whether the aeronautical telemetry operations in the band 1525-1535 MHz can be relocated to either the band 1435-1525 MHz or to the band 2310-2385 MHz.<sup>29</sup>

17. Commenters generally support the proposals set forth in the *Notice*. The Boeing Company ("Boeing") states that for many years the Commission has supported the adoption of generic MSS L-band allocations that accommodate a range of communications requirements in a flexible and economic manner.<sup>30</sup> Inmarsat Ventures PLC ("Inmarsat") supports the adoption of generic MSS allocations that are consistent with the decisions of WRC-97 and WRC-2000.<sup>31</sup> MSV states that a generic MSS allocation in the L-band will provide MSS licensees with maximum flexibility without limiting use of this spectrum for distress and safety communications.<sup>32</sup> Boeing, Inmarsat, MSV, and the Aerospace and Flight Test Radio Coordinating Council ("AFTRCC") also support the deletion of the secondary aeronautical telemetry allocation from the band 1525-1535 MHz. Boeing states that this band is unusable for secondary aeronautical telemetry because of the operation of primary services in the band;<sup>33</sup> Inmarsat cites potential harmful interference that the aeronautical telemetry service could cause to Inmarsat's mobile earth stations and could receive from MSS satellites in the band;<sup>34</sup> MSV states that aeronautical

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or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution 222 (WRC-2000) shall apply.)

<sup>26</sup> Footnote 5.362A reads as follows: In the United States, in the bands 1555-1559 MHz and 1656.5-1660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

<sup>27</sup> *Notice* at 19763.

<sup>28</sup> *Id.* at 19763-64.

<sup>29</sup> *Id.* The band 2310-2385 MHz is further discussed in Section III.C, *infra*.

<sup>30</sup> Boeing Comments at 5.

<sup>31</sup> Inmarsat Comments at 1.

<sup>32</sup> MSV Reply Comments at 5.

<sup>33</sup> Boeing Comments at 7.

<sup>34</sup> Inmarsat Comments at 3-4.

telemetry users themselves favor deletion of the secondary allocation in the band,<sup>35</sup> and AFTRCC states that its members have vacated this band and moved to the band 1435-1525 MHz.<sup>36</sup>

18. Boeing supports deleting footnote US308 and Inmarsat supports deleting both footnotes US308 and US315. Boeing argues that the United States participated in the development of International Telecommunication Union-Radiocommunication Sector ("ITU-R") footnotes 5.357A and 5.362A, which, Boeing maintains, generally embrace the scope of US308. Accordingly, Boeing recommends deleting US308 and incorporating by reference 5.357A and 5.362A in the U.S. Table.<sup>37</sup> Inmarsat contends that footnotes US308 and US315 imply a requirement for intersystem preemptive capability in the MSS that is infeasible because the ITU-R has not been able to determine how to establish a workable method of real-time preemption. Inmarsat also contends that these two US footnotes put certain MSS communications on a secondary basis with respect to the Global Maritime Distress and Safety System ("GMDSS") and AMS(R)S. Specifically, Inmarsat claims that footnote US315 gives all non-GMDSS communications a secondary status, which, Inmarsat maintains, conflicts with the *Notice*'s generic MSS allocation proposal; and that footnote US308 places systems not interoperable with AMS(R)S on a secondary basis, which, Inmarsat maintains, implies an inter-system preemption capability.<sup>38</sup> Therefore, Inmarsat recommends deleting these footnotes to resolve potential conflicts between them and adoption of the generic MSS proposal.<sup>39</sup> Inmarsat further recommends deleting footnote US309, which authorizes transmissions from terrestrial aeronautical stations directly to aircraft stations or between aircraft stations in the AMS(R)S in the 1545-1559/1646.5-1660.5 MHz Upper L-band, to extend or supplement satellite-to-aircraft links. Inmarsat states that it is unaware of any use of these terrestrial links, but that if there is a need to maintain a footnote to address such use, international footnotes 5.357<sup>40</sup> and 5.376<sup>41</sup> should replace US309.<sup>42</sup>

19. In reply comments, MSV urges the retention of footnotes US308, US315, and US309. MSV contends that the language in footnotes US308 and US315 has been codified for more than 15 and nine years, respectively, and is reasonably well-understood. MSV asserts that deleting these footnotes would introduce uncertainty without any apparent benefit. Further, MSV contends that Inmarsat is incorrect when it contends that these footnotes require intersystem preemption. MSV maintains that, despite the language in the footnotes that reference system interoperability, intersystem preemption is not required today in the United States.<sup>43</sup> MSV argues that footnote US309 is superior to international footnotes 5.357 and 5.376 because it allows for operation of aeronautical stations throughout the entire 28

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<sup>35</sup> MSV Reply Comments at 6.

<sup>36</sup> AFTRCC Comments at 2.

<sup>37</sup> Boeing Comments at 6.

<sup>38</sup> Inmarsat Comments at 5-6.

<sup>39</sup> *Id.* at 4.

<sup>40</sup> Footnote 5.357 reads as follows: Transmissions in the band 1545-1555 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

<sup>41</sup> Footnote 5.376 reads as follows: Transmissions in the band 1646.5-1656.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

<sup>42</sup> Inmarsat Comments at 6.

<sup>43</sup> MSV Reply Comments at 6-7.



megahertz of upper L-band spectrum at 1545-1559 MHz and 1646.5-1660.5 MHz, whereas the international footnotes limit such operation to only the bands 1545-1555 MHz and 1646.5-1656.5 MHz.<sup>44</sup>

20. *Decision.* We are adopting the generic MSS allocation proposal for the bands 1525-1559 MHz/1626.5-1660.5 MHz set forth in the *Notice*, deleting the secondary aeronautical telemetry allocation from the band 1525-1535 MHz and revising footnote US78 to remove the frequency 1525.5 MHz, and retaining footnotes US308 and US315. Commenters express strong support for a generic MSS allocation and deletion of the secondary aeronautical telemetry allocation, and we find that these changes will enhance flexibility and efficiency in the bands 1525-1559 MHz and 1626.5-1660.5 MHz. While there is a difference of opinion regarding the desirability of retaining footnotes US308 and US315, we concur with MSV that the advantages of retaining them outweigh the disadvantages. As noted by MSV, footnotes US308 and US315 are long-standing and replacement of them by international footnotes 5.357A and 5.362A, which have different language, would introduce confusion as to whether policy changes were being made. Further, sections 25.136(d) and (e) of the Commission's Rules set forth specific requirements for MSS mobile and land earth stations that satisfy the priority and preemption requirements of footnote US315.<sup>45</sup> Regarding footnote US309, we concur with MSV that this footnote allows terrestrial stations in the AMS(R)S to operate in more of the band than international footnotes 5.357A and 5.362A, in order to supplement satellite-to-aircraft links in that service. The broader spectrum range allowed by US309 is more consistent with the Commission's decision to expand AMS(R)S use within a generic MSS allocation. Thus, we decline to modify US309, which we did not propose to change in the *Notice*. Accordingly, we are retaining footnotes US308, US315, and US309. The table below shows the changes that we are making herein to the bands 1525-1559 MHz/1626.5-1660.5 MHz.

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<sup>44</sup> *Id.* at 7.

<sup>45</sup> See 47 C.F.R. §§ 25.136(d), (e).

**Table: Generic MSS**  
(All allocations are primary, except as noted)

Band (MHz)	Existing Allocations	Revised Allocations	Summary of Main Changes
1525-1530	MSS (downlinks) US380 (non-Federal Government licensee may also operate ATC with MSS network subject to particular rules) Secondary mobile (aeronautical telemetry) 5.341 (Passive research is being conducted in a search for intentional emissions of extraterrestrial origins) 5.351 (Band may not be used for feeder links.) US78 (permissible usage includes spacecraft telemetry)	1525-1535 MHz MSS (downlinks) US315 US380  5.341 5.351	Secondary mobile allocation in the band 1525-1535 MHz that was limited to aeronautical telemetry is deleted and US 78 modified to reflect this change.  Superfluous MMSS allocation in the band 1530-1544 MHz is deleted.
1530-1535	MSS (downlinks) US380 MMSS (downlinks) Secondary mobile (aeronautical telemetry) 5.341 5.351 US78 US315 (MMSS distress & safety has priority access & real-time pre-emptive capability over other MSS)		
1535-1544	MSS (downlinks) US380 MMSS (downlinks) 5.341 5.351 US315	1535-1559 MHz MSS (downlinks) US308 US309 US315 US380	
1544-1545	MSS (downlinks) 5.341 5.356 (limits use to distress and safety communications)	5.341 5.351 5.356	No change.
1545-1549.5	AMS(R)S (downlinks) Secondary MSS (downlinks) US380 5.341 5.351 US308 (AMS(R)S has priority access and real-time preemptive capability over other MSS) US309 (terrestrial extension of AMS(R)S permitted)		Limited AMS(R)S is replaced by generic MSS in the bands 1545-1549.5 MHz & 1558.5-1559 MHz; superfluous allocations are deleted.
1549.5-1558.5	AMS(R)S (downlinks) MSS (downlinks) US380 5.341 5.351 US308 US309		
1558.5-1559	AMS(R)S (downlinks) 5.341 5.351 US308 US309 US380		
1626.5-1645.5	MSS (uplinks) US380 MMSS (uplinks)  5.341 5.351 US315	1626.5-1660 MHz MSS (uplinks) US308 US309 US315 US380	Superfluous MMSS allocation in the band 1626.5-1645.5 MHz is deleted.
1645.5-1646.5	MSS (uplinks) 5.341 5.375 (limits use to distress and safety communications)	5.341 5.351 5.375	No change.
1646.5-1651	AMS(R)S (uplinks) Secondary MSS (uplinks) US380 5.341 5.351 US308 US309		Limited AMS(R)S is replaced by generic MSS in the bands 1646.5-1651 MHz & 1600-1660.5 MHz; superfluous allocations are deleted.
1651-1660	AMS(R)S (uplinks) MSS (uplinks) US380 5.341 5.351 US308 US309		
1660-1660.5	AMS(R)S (uplinks) RADIO ASTRONOMY  5.149 5.341 5.351 US308 US309 US380	MSS (uplinks) US308 US309 US380 RADIO ASTRONOMY  5.341 5.351 US342	5.149 has been replaced by US342 to better address RAS.

## B. RNSS Allocations

21. *Background.* GPS, which currently consists of 24 satellites operated by the U.S. Government, is authorized under the RNSS allocation. This constellation of satellites allows any person with a GPS receiver to determine his or her precise longitude, latitude, altitude, and time anywhere on the planet.<sup>46</sup> GPS currently uses the RNSS downlink allocations in the bands 1215-1240 MHz and 1559-1610 MHz. GPS provides two levels of service: a Standard Positioning Service (“SPS”) using the “L1” frequency<sup>47</sup> and a Precise Positioning Service (“PPS”) using the L1 and “L2” frequencies.<sup>48</sup> SPS is available to all users on a continuous, worldwide basis, free of any direct user charge.

22. At WRC-2000, the U.S. proposed to add a third civil GPS signal (“L5”) that can meet the needs of critical safety-of-life applications, such as civil aviation, on satellites scheduled for launch beginning in 2007. The U.S. stated that the required bandwidth of this signal is 24 megahertz. However, WRC-2000 adopted international footnote 5.328A, which allocates a wider band to accommodate such use. Specifically, WRC-2000 allocated the band 1164-1215 MHz for RNSS downlinks and space-to-space transmissions on a primary basis throughout the world, and specified provisional aggregate power flux-density (“pfd”) limits for use of that band.<sup>49</sup>

23. In letters to the Commission of July 2001 and August 2002, NTIA requested that the Commission not propose the domestic adoption of international footnote 5.328A because of the U.S. Government’s plans to use only the band 1164-1189 MHz for L5 and because uses for the remainder of the RNSS allocation had not been defined, nor had technical compatibility studies been performed.<sup>50</sup> NTIA therefore requested that consideration of the band 1189-1215 MHz be deferred,<sup>51</sup> but stated that it and Federal agencies were investigating the possibility of using the entire band 1164-1215 MHz.<sup>52</sup>

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<sup>46</sup> Each GPS satellite takes 12 hours to orbit the Earth. These satellites are equipped with accurate clocks so that they can broadcast signals with a precise time message. The GPS receiver uses the time signals from multiple satellites to determine precise latitude, longitude, and altitude.

<sup>47</sup> The International Civil Aviation Organization has designated the L1 links of GPS and the Russian GLONASS system as the principal elements of the Global Navigation Satellite System (“GNSS”). The GPS L1 SPS ranging signal is a 2.046 megahertz signal centered at 1575.42 MHz. The Wide Area Augmentation System (“WAAS”), when it becomes operational, will utilize the same band and carrier frequency as GPS L1.

<sup>48</sup> The GPS L2 link shares the band 1215-1240 MHz with radiolocation services, such as military radars. The 1240-1260 MHz band is shared by GLONASS L2 and the nationwide joint surveillance system radar network operated by the Federal Aviation Administration and the Department of Defense. The GPS L2 carrier frequency is 1227.60 MHz. Although the L2 frequency is currently not part of SPS, the U.S. Government has decided to add a second non-safety-of-life coded signal at the GPS L2 frequency on satellites scheduled for launch beginning in 2005.

<sup>49</sup> See 47 C.F.R. § 2.106, footnote 5.328A.

<sup>50</sup> See Letter from Associate Administrator, Office of Spectrum Management, NTIA, to Acting Chief, Office of Engineering and Technology (“OET”), FCC, dated July 18, 2001 (“July 2001 NTIA Letter”); and Letter from Acting Associate Administrator, Office of Spectrum Management, NTIA to Chief, OET, FCC, dated August 8, 2002 (“NTIA RNSS Letter”). In the NTIA RNSS Letter, NTIA revised its request for the L5 bandwidth from 24 megahertz to 25 megahertz (from the 1164-1188 MHz band to the 1164-1189 MHz band).

<sup>51</sup> See July 2001 NTIA Letter at Attachment 1.

<sup>52</sup> See NTIA RNSS Letter.

24. In its September 2001 Petition for Rule Making, Lockheed Martin requested that the entire 1164-1215 MHz band be implemented domestically for RNSS, stating that it may be more expedient for the Commission to specify the entire band, rather than just the portion of the band that the U.S. Government currently requires.<sup>53</sup> Lockheed Martin also requested that the RNSS allocation in the band 1164-1215 MHz be added to both sections 2.106 and 25.202(a) of the Commission's Rules, and that this allocation be made available to both Federal Government and non-Federal Government users;<sup>54</sup> that the RNSS allocation in the band 1559-1610 MHz be added to section 25.202(a) of the Commission's Rules;<sup>55</sup> and that the Commission permit the 1164-1215 MHz L5, the 1215-1240 MHz L2, and the 1559-1610 MHz L1 bands to be used for space-to-space transmissions.<sup>56</sup>

25. *Proposals.* As requested by NTIA, the Commission proposed in the *Notice* to adopt new footnote US385, which would allocate the band 1164-1189 MHz for RNSS downlink and space-to-space transmissions on a primary basis. It also proposed to add definitions of Differential Radionavigation Satellite Service ("Differential RNSS") Station and Differential Global Positioning System ("DGPS") Station to Part 2 of the Commission's Rules, as follows:

*Differential Radionavigation Satellite Service (Differential RNSS) Station.* A station used for the transmission of differential correction data and related information (such as ionospheric data and RNSS satellite integrity information) as an augmentation to an RNSS system for the purpose of improved navigation accuracy.

*Differential Global Positioning System (DGPS) Station.* A differential RNSS station for specific augmentation of GPS.<sup>57</sup>

26. Additionally, the Commission requested comment on whether the band 1164-1189 MHz should be added to a new footnote US343 that was proposed in WT Docket No. 01-289.<sup>58</sup> This footnote would provide that DGPS stations may be authorized on a primary basis in the bands 108-117.975 MHz and 1559-1610 MHz for the specific purpose of transmitting DGPS information intended for aircraft navigation. The Commission further sought comment on whether it should allocate domestically the international RNSS allocation at 1189-1215 MHz, and in particular on whether this allocation is needed to support U.S. requirements. In the *Notice*, the Commission observed that studies continue in the international process to determine the aggregate impact of multiple RNSS systems on incumbent aeronautical radionavigation service ("ARNS") systems and that, given the safety-of-life aspects of these ARNS systems, the Commission did not anticipate adopting this additional allocation unless a need is demonstrated and studies are done that support such a move.<sup>59</sup>

27. The *Notice* also proposed to add a space-to-space directional indicator to the primary RNSS allocation in the bands 1215-1240 MHz and 1559-1610 MHz, which are currently limited to

<sup>53</sup> See Lockheed Martin Petition for Rule Making, *supra* n.11, at 11-12.

<sup>54</sup> *Id.* at 13. Section 2.106 is the U.S. Table of Frequency Allocations and section 25.202(a) lists frequencies available for various satellite services.

<sup>55</sup> *Id.* at Attachment 2.

<sup>56</sup> *Id.* at 6, 14, and 17.

<sup>57</sup> *Notice* at 19769.

<sup>58</sup> See Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service, WT Docket No. 01-289, *Notice of Proposed Rule Making*, 16 FCC Rcd 19005 (2001).

<sup>59</sup> *Notice* at 19770.

downlink transmissions, to recognize current and future use of spaceborne RNSS receivers for scientific and commercial applications. Finally, the *Notice* declined to propose adding the RNSS L1 and L5 frequencies to section 25.202(a) of the Commission's Rules, as requested by the Lockheed Martin petition for rule making.<sup>60</sup>

28. *Comments.* Boeing and Lockheed Martin argue that the entire 1164-1215 MHz band should be allocated for the RNSS domestically, and NTIA voices conditional support for such an allocation. Boeing states that this increased allocation would facilitate spectrum sharing between multiple RNSS systems and be consistent with the principle that the Commission should, whenever possible, align the U.S. Table with international allocations.<sup>61</sup> Boeing acknowledges that this band is already allocated in the United States for the ARNS, but maintains that the 2003 World Radiocommunication Conference ("WRC-03") power limits that the U.S. is proposing for RNSS operations in the band will adequately protect ARNS operations.<sup>62</sup> Boeing therefore recommends that, consistent with this power limit proposal to WRC-03, the Commission adopt a coordination requirement for RNSS networks in the band 1164-1215 MHz that ensures that the aggregate equivalent power flux density ("epfd") from all RNSS systems does not exceed -121.5 dBW/m<sup>2</sup>/MHz.<sup>63</sup>

29. Lockheed Martin contends that while a U.S. RNSS licensee would be expected to limit its operations to the band 1164-1189 MHz, there are other RNSS systems that may seek to use spectrum above 1189 MHz. Lockheed Martin has pending with the Commission an application to provide RNSS and differential GPS in the L1 and L5 frequencies.<sup>64</sup> Lockheed Martin therefore recommends that the Commission not act in the instant proceeding in a manner that would be perceived internationally as an attempt to exclude that upper spectrum's availability in North America.<sup>65</sup> Lockheed Martin also contends that circumstances have changed significantly since NTIA's July 2001 request to defer consideration of GPS L5 use in the band 1189-1215 MHz. Specifically, Lockheed Martin contends that ITU-R studies show that multiple RNSS systems operating across the entire 1164-1215 MHz band would not have an adverse impact on existing ARNS systems, provided that the epfd level produced by all space stations of all RNSS systems does not exceed -121.5 dBW/m<sup>2</sup>/MHz in any one megahertz band. Lockheed Martin submits that a decision to adopt domestically the entire WRC-2000 allocation to RNSS at 1164-1215 MHz would not prejudice or otherwise prejudice the ability of the Commission to deny RNSS systems access to the band 1189-1215 MHz should there be valid technical reasons for doing so.<sup>66</sup>

30. Lockheed Martin also opposes adoption of the proposed footnote US385, supports use of the bands 1164-1215 MHz and 1559-1610 MHz for space-to-space transmissions, supports expanding the

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<sup>60</sup> *Id.*

<sup>61</sup> Boeing's application to provide a Navigation Augmentation Service for aircraft using GPS satellite radionavigation in the GPS L2 band was dismissed as incomplete. *See The Boeing Company*, DA 03-2073 (released June 24, 2003).

<sup>62</sup> Boeing Comments at iii.

<sup>63</sup> *Id.* at 10-11.

<sup>64</sup> *See* Lockheed Martin Corporation, Application for Authority to Launch and Operate a Global System of Geostationary Orbit Satellites in the Radionavigation Satellite Service, File Nos. SAT-LOA-19990427-00045/00046/00047/00048/00049/00050, filed April 27, 1999. In its Application, Lockheed Martin also requested the L2 frequencies, but on July 30, 2003, it filed an Amendment to its application, in which it withdrew that request and reaffirmed its request for the L1 and L5 frequencies.

<sup>65</sup> Lockheed Martin Comments at 8.

<sup>66</sup> *Id.* at 10-12.

current GPS L2 spectrum at 1215-1240 MHz to 1215-1300 MHz, and supports removing the Federal Government restriction from the L2 spectrum. It also supports adding the international RNSS allocations at 1164-1215 MHz and 1559-1610 MHz to the Part 25 list of frequency bands available for satellite services. With respect to footnote US385, Lockheed Martin asserts that the obligation in that footnote requiring RNSS systems to neither cause harmful interference to, nor claim protection from, ARNS systems may be perceived as creating an additional or inconsistent obligation on RNSS systems, which must comply with technical determinations made in international fora.<sup>67</sup> With respect to use of the bands 1164-1215 MHz and 1559-1610 MHz for space-to-space transmissions, Lockheed Martin notes that WRC-2000 made this spectrum available for such transmissions, and that these additions will provide greater accuracy and integrity for the Global Navigation Satellite System.<sup>68</sup> With respect to expanding the current GPS L2 spectrum at 1215-1240 MHz to 1215-1300 MHz, Lockheed Martin states that WRC-2000 expanded the L2 allocation to 1215-1300 MHz and that operational experience demonstrates that co-primary sharing between RNSS and radars in the expanded band can be accomplished without harmful interference. Lockheed Martin argues that failure to expand the band will lead to anticompetitive concerns internationally. With respect to removing the Federal Government restriction from the L2 spectrum, Lockheed Martin maintains that in 1998 the U.S. Government announced that a second civil signal would be added to GPS in the L2 band. Accordingly, Lockheed Martin recommends that the Federal Government-only restriction be removed from this band.<sup>69</sup> Finally, with respect to adding the international RNSS allocations at 1164-1215 MHz and 1559-1610 MHz to the Part 25 list of frequency bands available for satellite services, Lockheed Martin acknowledges that it would not be inconsistent with precedent for the Commission to defer consideration of additional RNSS bands to a separate service rules proceeding, but recommends that if the Commission takes that approach it ensure it not delay the authorization of RNSS systems for which applications are pending.<sup>70</sup>

31. NTIA states that it recommends an RNSS allocation in the 1164-1215 MHz band, but notes that the Federal Aviation Administration ("FAA") has not yet conducted an analysis for the 1189-1215 MHz band and does not know what would be required to accommodate RNSS in that band. Specifically, FAA expresses concern that there may be stations in the aeronautical radionavigation service in the 1189-1215 MHz band that would have to be retuned as a result of RNSS use of that band, and states that an analysis needs to be performed regarding the sufficiency of spectrum for such retuning. NTIA states that the FAA is planning to conduct studies in 2004 regarding RNSS use of the 1189-1215 MHz band, but that the FAA will require detailed technical information, including receiver performance criteria, from RNSS proponents. NTIA further states that the FAA believes that, until its studies are complete and show that RNSS operations in the 1189-1215 MHz band are viable, RNSS should not be licensed in that band. NTIA therefore recommends that the Commission add a footnote to the 960-1215 MHz band in the U.S. Table, which would read as follows:

The band 1164-1215 MHz is also allocated to the radionavigation-satellite-service (space-to-Earth, space-to-space) on a primary basis. In this band, stations in the radionavigation-satellite-service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical radionavigation service.<sup>71</sup>

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<sup>67</sup> *Id.* at 12-13.

<sup>68</sup> *Id.* at 13-14.

<sup>69</sup> *Id.* at 14-15.

<sup>70</sup> *Id.* at 15-16. See also Lockheed Martin Petition for Rule Making, *supra* n.11, at Attachment 2.

<sup>71</sup> See Letter from Acting Associate Administrator, Office of Spectrum Management, NTIA to Chief, OET, FCC, dated September 12, 2003.

32. Inmarsat supports the proposed RNSS allocation in the band 1164-1189 MHz, but opposes adoption of proposed footnote US385, contending that it would cause confusion and is unnecessary. Inmarsat argues that footnote 5.328A provides for an aggregate pfd limit, which defines the power level to which the ARNS shall be protected, and that any additional requirement to not cause harmful interference to the ARNS is superfluous and possibly contradictory to the specific power limits that are designed to achieve this same goal.<sup>72</sup> Inmarsat also argues that the proposed definitions of Differential RNSS and DGPS stations create ambiguity and confusion. Inmarsat states that its space stations meet the proposed definitions, while also meeting the definition of a space station in RNSS; and that its land earth stations meet the proposed definitions, while also meeting the definition of an earth station in the FSS. Inmarsat contends that the existing rules that apply to RNSS space stations and FSS earth stations are satisfactory and that there does not appear to be any justification for applying different rules to these station types.<sup>73</sup> Finally, Inmarsat states that it intends to provide space capacity for GPS augmentation service with a signal in the band 1164-1189 MHz, and that it does not see the need for making special provisions for RNSS systems that are used for augmentation purposes. However, Inmarsat recommends that, if the Commission adds that band to the proposed footnote US343, the proposed amendment to the footnote should apply to Inmarsat satellites.<sup>74</sup>

33. *Decision.* Since adoption of the *Notice* in this docket, WRC-03 has taken certain decisions regarding RNSS that are relevant to issues raised in this proceeding. In particular, as noted by NTIA, WRC-03 has modified footnote 5.328A of the international Table of Allocations to clarify that all stations in the RNSS operating in the band 1164-1215 MHz shall operate in accordance with specified aggregate interference protection criteria for ARNS ( $-121.5 \text{ dB(W/m}^2\text{)}$  in any 1 MHz band) and not claim protection from stations in the ARNS operating in the 960-1215 MHz band.<sup>75</sup> Administrations operating RNSS stations in these bands are to cooperate to ensure that the protection criteria are satisfied. In the *Notice* in this proceeding, we proposed to add a primary RNSS allocation in the band 1164-1189 MHz, and sought comment on whether we should extend the allocation to the band 1189-1215 MHz, noting in regard to the latter band that studies were underway in the international process to determine the aggregate impacts of multiple RNSS systems on incumbent ARNS systems. We stated that we would not anticipate adopting this additional allocation unless a need was demonstrated and studies completed.<sup>76</sup> Although we did not propose pfd limits on RNSS systems, we did propose to adopt a new United States footnote (USyyy) that would require RNSS stations to not cause interference to, nor claim protection from, stations in the ARNS.<sup>77</sup> Given the WRC-03 results and support on the record in this proceeding, we conclude that the RNSS allocation should extend from 1164-1215 MHz. This increased allocation will provide flexibility for potential future GPS implementation plans and facilitate cooperative efforts among administrations operating RNSS systems in these bands to protect ARNS systems. However, we concur with NTIA that a footnote – rather than a table – allocation for the new 1164-1215 MHz RNSS band is appropriate, and that this footnote should include language specifying that RNSS shall not cause harmful

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<sup>72</sup> Inmarsat Comments at 7.

<sup>73</sup> *Id.* at 8.

<sup>74</sup> *Id.*

<sup>75</sup> See *WRC-03 Provisional Final Acts* at 14, 71, and 484. This footnote modification became effective July 5, 2003, and applies to a RNSS system for which complete coordination or notification information was received by the ITU after June 2, 2000. *Id.* at 71. Pursuant to new footnote 5.BA02, no constraints in addition to those in place prior to WRC-2000 will be placed on RNSS use in the band 1215-1260 MHz brought into use before June 2, 2000. *Id.* at 13 and 499.

<sup>76</sup> See *Notice* at ¶ 41.

<sup>77</sup> *Id.* at ¶ 37 and Appendix.

interference to ARNS. While Inmarsat contends that this language could be construed as an additional requirement or superfluous to the WRC-03 aggregate interference protection criteria, we find it appropriate as an interim measure. We intend to address how best to reference the WRC-03 protection criteria for ARNS, whether by adopting international footnote 5.328A or modifying our Part 25 satellite service rules, when we initiate a proceeding to address WRC-03 implementation.<sup>78</sup>

34. With regard to Lockheed Martin's recommendations that we expand the current GPS L2 spectrum at 1215-1240 MHz to 1215-1300 MHz and permit non-Federal Government RNSS use of the band 1215-1300 MHz, we observe that the *Notice* did not propose either of those changes and thus we decline to consider these changes at this time. With regard to Lockheed Martin's recommendation that we add the international RNSS allocations at 1164-1215 MHz and 1559-1610 MHz to the Part 25 list of frequency bands available for satellite services, we see no advantage to be gained by taking that action now. As the Commission stated in the *Notice*, such action would be more appropriate in connection with development of service and licensing rules for the RNSS frequency bands, and following development of international technical criteria for operations in these bands.<sup>79</sup> We will explore all of these issues when we consider the WRC-03 protection criteria for ARNS in the WRC-03 implementation proceeding reference in the preceding paragraph.

35. With regard to Inmarsat's recommendation that we not adopt the proposed definitions of Differential RNSS and DGPS stations, we disagree with Inmarsat that these definitions create ambiguity or confusion between them and any current definition in either our rules or in the ITU rules. The definitions are simply informational. As we observed in the *Notice*, differential RNSS correction data and related information is transmitted in a data link and sometimes is not within the RNSS. These definitions clarify that this information augments the RNSS system and improves navigation accuracy. Accordingly, we are adding the proposed definitions of Differential RNSS and DGPS stations to Part 2 of our Rules.

36. Finally, with regard to Inmarsat's comments on whether the band 1164-1189 MHz should be added to proposed footnote US343, we note that this footnote was proposed in the *Notice of Proposed Rule Making* in WT Docket No. 01-289,<sup>80</sup> which is still pending before us. We do not wish herein to prejudge whether proposed US343 will be adopted in that proceeding; hence, we will defer consideration of the possible addition of the band 1164-1189 MHz to proposed US343 to the *Report and Order* in WT Docket No. 01-289.

#### C. Satellite DARS and Adjacent Bands.

37. *Background.* The band 2320-2345 MHz is allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. This service is generally known as Satellite DARS. The Satellite DARS band is also allocated on a secondary basis to the mobile service for non-Federal Government use and to the fixed, mobile, and radiolocation services for Federal Government use.<sup>81</sup> Footnote US276 states that the mobile allocation is limited to aeronautical telemetry

<sup>78</sup> This proceeding will also address modifying the 1164-1215 MHz RNSS allocation from a table footnote to a direct table allocation in accordance with the Final Acts adopted at WRC-03.

<sup>79</sup> *Notice* at 19770.

<sup>80</sup> See *Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service*, WT Docket No. 01-289, *Notice of Proposed Rule Making*, 16 FCC Rcd 19005 (2001).

<sup>81</sup> Footnote US 328 states that the mobile and radiolocation services are allocated on a primary basis until Satellite DARS has been brought into use. In addition, that footnote states that Satellite DARS during implementation should minimize its impact on the expendable and reusable launch vehicle frequency 2332.5 MHz to the extent possible. See 47 C.F.R. § 2.106, footnote US328.



and associated telecommand operations ("flight testing").<sup>82</sup> Flight test use of the Satellite DARS band remains permissible for the Aviation Services.<sup>83</sup> The bands 2310-2320 MHz and 2345-2360 MHz are allocated to the fixed, mobile, radiolocation, and broadcasting-satellite service (sound) and complementary terrestrial broadcasting services on a co-primary basis for non-Federal Government use.

38. *Proposals.* In the *Notice*, the Commission proposed to revise footnote US328 to permit flight testing operations to continue on a secondary basis in the band 2320-2345 MHz. The Commission also proposed to delete the radiolocation service from footnote US328 because there are no non-Federal Government radiolocation operations in the Satellite DARS band and because the Federal Government already has a secondary direct Table allocation for this service.<sup>84</sup> It further proposed to delete the requirement that Satellite DARS licensees take cognizance of the launch vehicle frequency 2332.5 MHz because satellite DARS systems have been implemented.<sup>85</sup> In addition, the Commission requested comment on whether all secondary operations should be deleted from this band in order to protect Satellite DARS operations.<sup>86</sup> It proposed to amend section 87.303(d)(1) to state that frequencies in the band 2310-2360 MHz may be assigned on a secondary basis for telemetry and telecommand operations associated with the flight testing of manned or unmanned aircraft and missiles, or their major component, and proposed to delete the launch vehicle frequency 2332.5 MHz from section 87.303(d)(1). The Commission also proposed to add cross-references in the U.S. Table to Part 25, Satellite Communications, in the band 2320-2345 MHz, and to Part 87, Aviation Services, in the band 2310-2390 MHz. Finally, the *Notice* proposed to delete footnote 5.396 from the band 2310-2360 MHz from the Federal Government Table because that footnote pertains to the broadcasting-satellite service, which is not regulated by NTIA; and to delete footnote US338 from the band 2310-2320 MHz because that footnote does not pertain to that band.<sup>87</sup> These combined actions were designed to clarify use of the band 2310-2390 MHz and to permit the new satellite DARS service to operate in an interference-free environment in the band 2320-2345 MHz.

39. *Comments.* Only AFTRCC and Boeing commented on the proposals in the *Notice* pertaining to the band 2310-2390 MHz set forth in the *Notice*. AFTRCC states that there is a potential for interference between aeronautical telemetry and Satellite DARS operations in the band 2320-2345 MHz, and that any interference to flight test operations poses a risk to safety of life and property. Accordingly, AFTRCC argues, aeronautical telemetry users will not use the band 2320-2345 MHz on a secondary basis, and so it is appropriate to delete the aeronautical telemetry allocation from that band.<sup>88</sup> Boeing states that, despite its heavy use of flight test spectrum, the Commission should eliminate the secondary aeronautical telemetry allocation in that band because it is now unusable for flight test operations due to Satellite DARS operations.<sup>89</sup>

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<sup>82</sup> See 47 C.F.R. § 2.106, footnote US276.

<sup>83</sup> See 47 C.F.R. § 87.303(d)(1).

<sup>84</sup> *Notice* at 19771.

<sup>85</sup> *Id.* at 19771-72.

<sup>86</sup> *Id.* at 19772.

<sup>87</sup> *Id.*

<sup>88</sup> AFTRCC Comments at 3.

<sup>89</sup> Boeing Comments at 6-7.

40. *Decision.* We are adopting the proposals pertaining to the band 2310-2390 MHz set forth in the *Notice*, except that we are deleting the mobile service allocation from band 2320-2345 MHz in the U.S. Table and are deleting footnotes US276 and US328, which limit uses under the mobile allocation, from that band. AFTRCC's and Boeing's comments convince us that there is no need to maintain a secondary aeronautical telemetry allocation in the band 2320-2345 MHz because such an allocation would be unusable due to potential interference from new Satellite DARS operations. Because footnote US276 currently limits the use of the mobile service in the band 2320-2385 MHz to aeronautical telemetry, this United States footnote is retained but henceforth will apply only to the band 2360-2385 MHz. In contrast, footnote US328, which applies only to the band 2320-2345 MHz, is deleted in its entirety. In all other respects, we adopt the proposals for the band 2310-2390 MHz set forth in the *Notice*, as shown in Appendix B. This action will eliminate possible interference to Satellite DARS operations, as well as remove confusion regarding use of the band 2310-2390 MHz.

#### D. ITFS/MDS Band

41. *Background.* In the United States, the band 2500-2690 MHz is allocated to the fixed, mobile except aeronautical mobile, BSS, and FSS services on a co-primary basis for non-Federal Government use.<sup>90</sup> The band 2500-2690 MHz is currently used exclusively for fixed purposes by the Instructional Television Fixed Service ("ITFS") and the Multipoint Distribution Service ("MDS").<sup>91</sup> As an adjunct to the original ITFS use, the BSS allocation is limited by footnote NG101 to "community reception" of educational TV programming and public service information.<sup>92</sup> Similarly, the FSS allocation is limited by footnote NG102 to educational FSS use throughout the United States, except that the FSS allocation may be also used for common carrier purposes in Alaska, Hawaii, and certain Pacific islands. In order to preserve spectrum for FSS use in Alaska, footnote NG47 states that the band 2655-2690 MHz is not available for use by terrestrial services. These limited BSS and FSS allocations are unused in the United States.<sup>93</sup>

42. WRC-2000 identified the band 2500-2690 MHz for use by third generation wireless systems ("3G"). In order to provide the ITFS and MDS licensees in this band with additional flexibility, the Commission recently allocated the band 2500-2690 MHz to the mobile, except aeronautical mobile, service as reflected above.<sup>94</sup> No mobile service rules have been established to this point; however, a

<sup>90</sup> An allocation to the mobile except aeronautical mobile service means that land mobile and maritime mobile services may be provided, but that aeronautical mobile services are prohibited.

<sup>91</sup> The MDS channels that use the band 2596-2644 MHz are known as the Multichannel Multipoint Distribution Service. See 47 C.F.R. § 21.2.

<sup>92</sup> Community reception in the broadcasting-satellite service is the reception of emissions from a BSS space station by receiving equipment, which in some cases may be complex and have antenna larger than those used for individual reception, and intended for use (1) by a group of the general public at one location; or (2) through a distribution system covering a limited area. See 47 C.F.R. § 2.1. The community reception concept appears to have been overtaken by individual reception of BSS programming, such as that offered by DirecTV and the DISH Network.

<sup>93</sup> We observe that Canada has filed a coordination request for a seven BSS GSO satellite system with the ITU that would, if approved, provide television and other services to passengers on aircraft using the band 2535-2655 MHz. In addition, because the band 2500-2690 MHz was identified at WRC-2000 as an additional band for IMT-2000 systems, WRC-03 agenda item 1.34 reviewed the threshold values for BSS (sound) systems using NGSO satellites in the sub-band 2630-2655 MHz. The outcome of this review was that footnote 5.416 was modified and footnotes 5.418Bbis and 5.418Cbis were added to the International Table of Allocations in all three regions; see *WRC-03 Provisional Final Acts* at 22-25. These footnote changes do not affect our decision herein.

<sup>94</sup> See *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless*

rulemaking proceeding to establish such rules was recently initiated.<sup>95</sup> In the *New Advanced Wireless Services First R&O and MO&O*, the Commission found that sharing between terrestrial systems and MSS downlinks in the band 2500-2520 MHz and MSS uplinks in the band 2670-2690 MHz would not be feasible.<sup>96</sup>

43. *Proposals.* In the *Notice*, the Commission stated its belief that FSS and BSS operations in the band 2500-2690 MHz could affect the reliability of point-to-multipoint channels and low-power consumer response channels in that band and noted that service rules for advanced mobile operations may also be implemented in that band in the future. Therefore, the Commission proposed to delete the unused and limited FSS and BSS allocations from the band 2500-2690 MHz in order to remove regulatory uncertainty. Consistent with its proposal to delete these allocations, the Commission also proposed to delete footnotes NG101 and NG102, which limit the use of the allocations. In addition, it proposed to delete footnote NG47 so as to make the band 2655-2690 MHz available for ITFS/MDS use in Alaska.<sup>97</sup>

44. *Comments.* AirTV Limited ("AirTV") states that it has developed and plans to implement a unique satellite-based Direct-to-Aircraft ("DTA") entertainment and e-mail system in the band 2535-2670 MHz that will operate in conformity with the 2520-2670 MHz BSS allocation. Accordingly, AirTV opposes deleting that allocation. AirTV also supports deleting footnote NG101 to allow a broader range of programming to commercial airline passengers.<sup>98</sup> Additionally, AirTV claims that currently there is no satellite system or other infrastructure that can provide the capacity and coverage needed to deliver the services that it plans, and that if the 2500-2600 MHz BSS allocation were to be deleted, AirTV would be able to provide service everywhere in the world except the United States. AirTV argues that such a situation would create a protectionist and anti-competitive market for its commercial airline services, which would be counter to the World Trade Organization ("WTO") agreement that encourages international competition.<sup>99</sup>

45. Boeing and the Wireless Communications Association International, Inc. ("WCA") support deleting the 2500-2690 MHz BSS allocation. Boeing argues that AirTV is incorrect in arguing that deleting that allocation would harm competition for broadband satellite services to aircraft. Boeing maintains that its satellite-based "Connexion" service, can make broadband data and entertainment services available to airline passengers and crews globally,<sup>100</sup> and that other companies have also proposed to provide broadband satellite services to aircraft in the United States.<sup>101</sup> Boeing also argues

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*Services*, ET Docket No. 00-258, *First Report and Order and Memorandum Opinion and Order*, 16 FCC Rcd 17222 (2001) ("*New Advanced Wireless Services First R&O and MO&O*").

<sup>95</sup> See *Amendment of Parts 1, 21, 73, 74, and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, WT Docket No. 03-66, RM-10586, *Notice of Proposed Rule Making and Memorandum Opinion and Order*, 18 FCC Rcd 6722 (2003).

<sup>96</sup> *New Advanced Wireless Services First R&O and MO&O* at ¶ 12.

<sup>97</sup> *Notice* at 19773.

<sup>98</sup> AirTV Comments at 1-2.

<sup>99</sup> *Id.* at 9-10.

<sup>100</sup> Boeing's Connexion service uses a fleet of mobile earth stations operating in the AMSS in the Ku-band (12/14 GHz band range). See Boeing Reply Comments at 3.

<sup>101</sup> JetBlue Airways provides its passengers with up to 24 channels of DirecTV television programming as part of its in-flight entertainment, and Tenzing offers airlines an in-flight e-mail capability, employing satellite and terrestrial communications with an onboard local area network. The latter service is currently available on select flights on

that the WTO protocol does not apply to satellite transmission of direct-to-home and direct broadcast satellite services in the United States, and that the U.S. has the right to limit the issuance of new satellite authorizations when faced with insufficient spectrum availability. Accordingly, Boeing contends that, at least from the standpoint of competition analysis, the *Notice's* proposal to delete the 2500-2690 MHz BSS allocation is justified by the public interest and is fully consistent with international requirements.<sup>102</sup>

46. WCA contends that AirTV is asking not only to preserve the 2500-2690 MHz BSS allocation, but to expand the nature of the services that can be provided under that allocation. WCA maintains that AirTV's support for deleting footnote NG101 is not a logical outgrowth of the proposal set forth in the *Notice*, which was to eliminate BSS operations in the band 2500-2690 MHz.<sup>103</sup> WCA also claims that AirTV's DTA system could cause interference to MDS/ITFS operations in that band, and that AirTV has not met the burden of demonstrating that its service will not cause interference to those operations. Finally, WCA contends that AirTV's proposed service can be provided by other satellite services that do not jeopardize the provision of MDS/ITFS.<sup>104</sup>

47. *Decision.* We are adopting the proposals pertaining to the band 2500-2690 MHz set forth in the *Notice*. No party objects to the proposal to delete the FSS allocation in that band, and only AirTV objects to the proposal to delete the BSS allocation in that band. We make no finding on the potential benefits of AirTV's proposed DTA system. However, we find that such a system would increase costs for terrestrial services due to the need to mitigate interference caused by AirTV's system. We concur with Boeing that the WTO agreement does not apply to AirTV's system and thus the U.S. may limit new satellite authorizations when faced with potential interference issues with incumbent operations. We concur with WCA that AirTV has not met the burden of demonstrating that its system will not cause interference to terrestrial services that use the band 2520-2670 MHz. Accordingly, as proposed in the *Notice* and as shown in Appendix B, we are deleting the FSS and BSS allocations from the band 2500-2690 MHz and are deleting footnotes NG47, NG101, and NG102.

#### E. Space Science Services

48. *Background.* The space science services include the EESS, SRS, METSAT, and space operation services. These services are used to measure phenomena that can impact the Earth's habitat and its environmental quality, to provide weather forecasts, and to explore the planets. Active and passive spaceborne microwave sensors are tools that provide environmental data on a repetitive and global scale with an ability to penetrate clouds to obtain measurements unavailable by other means. In addition to using spectrum for active and passive sensing from space, the space science services use spectrum for command, tracking, data acquisition, and communications with satellites.

49. *Proposals.* With respect to active spaceborne sensors, in the *Notice* the Commission proposed, in response to a request from NTIA, to allocate the bands 1215-1300 MHz, 3100-3300 MHz, 5255-5350 MHz, 8550-8650 MHz, 9500-9800 MHz, 13.25-13.4 GHz, 17.2-17.3 GHz, and 35.5-36 GHz to the EESS (active) and SRS (active); the bands 5250-5255 MHz and 13.4-13.75 GHz to the EESS (active) and SRS; and the band 5350-5460 MHz to the EESS (active). These allocation changes would implement WRC-97 allocation changes for the space science services. For the Federal Government

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Cathay Pacific Airlines and on United Airlines' domestic flights. See, respectively, <http://www.aviationtoday.com/reports/avionics/previous/0600/06scan.htm>; <http://www.tenzing.com>; and <http://www.ual.com/press/detail/0,1442,51106,00.html>

<sup>102</sup> Boeing Reply Comments at 2-5.

<sup>103</sup> WCA Reply Comments at 3-4.

<sup>104</sup> *Id.* at 4-6.

Table, the Commission proposed that all of these active spaceborne sensor allocations have primary status, except in the band 3100-3300 MHz, where the sensors would continue to have secondary status. For the non-Federal Government Table, the Commission proposed that all of these allocations have secondary status. At the request of NTIA, the Commission also proposed to add five international footnotes to the U.S. Table to ensure that active spaceborne sensors not cause harmful interference to, nor constrain the use and development of, incumbent primary services in the bands 1215-1300 MHz, 5350-5460 MHz, and 13.25-13.75 GHz. Finally, and also at the request of NTIA, the Commission proposed to add two international footnotes to the U.S. Table to ensure that primary SRS allocations in the bands 5250-5255 MHz and 13.4-13.75 GHz are limited to active spaceborne sensors and that other space research users are on a secondary basis. Consistent with these proposals, the Commission proposed to delete from the U.S. Table international footnotes 5.333 and 5.551, which provide the current secondary active spaceborne sensor allocations, and also proposed to delete the secondary allocation for the SRS (Earth-to-space) in the band 13.25-13.4 GHz.<sup>105</sup>

50. With respect to other space science services, in the band 401-403 MHz the Commission proposed in the *Notice*, in response to a request from NTIA, to upgrade the secondary EESS and METSAT allocations to primary status for Federal Government use and to limit non-Federal Government use of these allocations to earth stations transmitting to Federal Government space stations. The Commission requested comment on whether non-Federal Government use of these allocations should be limited to earth stations transmitting to Federal Government space stations. The Commission proposed to allocate the band 410-420 MHz to the SRS (space-to-space) on a primary basis for Federal Government use and to limit its use, through the application of footnote 5.268, to permit communications among astronauts and their base spacecraft while those astronauts are performing activities outside the base spacecraft.<sup>106</sup> In the band 7750-7850 MHz, the Commission proposed an allocation for Federal Government METSAT downlink use, limited to NGSO satellites, as requested by NTIA.<sup>107</sup> In the band 8400-8450 MHz, the Commission proposed an allocation for Deep Space downlinks on a secondary basis, to permit non-Federal Government entities, such as educational institutions, to perform scientific research in cooperation with the National Aeronautics and Space Administration ("NASA").<sup>108</sup> In the 32 GHz band range, the Commission proposed to delete the unused ISS allocation from the band 32-32.3 GHz in order to protect deep space reception at Goldstone, California, and proposed to move the text of an international footnote into a U.S. footnote to reflect the anticipated prohibition on use of the band 32-32.3 GHz by the ISS.<sup>109</sup> Finally, in the 34 GHz frequency range, the Commission proposed to move the SRS (deep space) (Earth-to-space) allocation at 34.2-34.7 GHz from a U.S. footnote into the U.S. Table as a direct Table allocation, with Federal Government use on a primary basis and with non-Federal Government use on a secondary basis; and proposed to move the Goldstone site restriction in that same band from footnote US252 to US262.<sup>110</sup>

51. *Comments.* Only Lockheed Martin and Medtronic, Inc. ("Medtronic") commented on any of the proposals in the *Notice* relating to the space science services. Lockheed Martin disagrees with the proposal to permit additional primary Federal Government use of the band 1215-1300 MHz. Lockheed Martin argues that primary Federal Government EESS and SRS active sensor operations would

<sup>105</sup> *Notice* at 19778-79.

<sup>106</sup> *Id.* at 19781-19782.

<sup>107</sup> *Id.* at 19782-83.

<sup>108</sup> *Id.* at 19783.

<sup>109</sup> *Id.* at 19784.

<sup>110</sup> *Id.* at 19785.

pose a threat of harmful interference to domestic RNSS operations in the band 1215-1240 MHz and to additional global RNSS operations in the band 1240-1300 MHz, and that RNSS operations could also compromise active sensor operations. Accordingly, Lockheed Martin recommends that primary active sensor operations in the band 1215-1300 MHz not be permitted without further study.<sup>111</sup> Medtronic supports limiting non-Federal Government use of the EESS and METSAT allocations in the band 401-403 MHz to earth stations transmitting to Federal Government space stations. Medtronic contends that there has been no showing of need for a non-Federal Government service to communicate to non-Federal Government space stations in that band, and that such operations could cause interference to Medtronic's Medical Implant Communications Service ("MICS") that operates on a secondary basis in the sub-band 402-403 MHz. Therefore, Medtronic states that transmissions to non-Federal Government space stations in that band should not be permitted until such time as proposed operational parameters for power, location, number of stations, and other relevant facts are made available that allow for an analysis of the spectrum sharing capabilities between those operations and MICS operations.<sup>112</sup>

52. *Decision.* We are adopting the proposals to provide a primary Federal Government allocation and a secondary non-Federal Government allocation for EESS (active) and SRS (active) in the band 1215-1260 MHz, as shown in Appendix B. With regard to Lockheed Martin's concerns that a primary allocation for EESS (active) and SRS (active) would pose a threat of harmful interference to domestic and global RNSS, we disagree. First, we are adding international footnote 5.332, which states that, for the band 1215-1260 MHz, active spaceborne sensors in the EESS and SRS shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the RNSS and other services allocated on a primary basis. Second, we observe that the international frequency table already contains primary allocations for RNSS, EESS (active) and SRS (active) in the band 1215-1300 MHz. Thus, if the U.S., in the future, decides to add a primary RNSS allocation to the 1260-1300 MHz band, such a decision would be consistent with the existing international allocation. Any appropriate sharing criteria can be worked out at that time. With regard to Medtronic's recommendation that non-Federal Government use of the EESS and METSAT allocations in the band 401-403 MHz be limited to earth stations transmitting to Federal Government space stations, no party supports permitting earth stations to transmit to non-Federal Government space stations in this band and we did not propose such use. Accordingly, we decline to permit that use.

#### F. The Band 25.25-27.5 GHz

53. *Background.* In the United States, the band 25.25-27.5 GHz is used primarily by the Federal Government. Specifically, in the Federal Government Table, the band 25.25-27.5 GHz is allocated to the fixed and mobile services on a co-primary basis and to the EESS (space-to-space) on a secondary basis, and the sub-band 25.25-27 GHz is allocated to the standard frequency and time signal-satellite service (Earth-to-space) on a secondary basis. In the non-Federal Government Table, the band 25.25-27.5 GHz is allocated to the EESS (space-to-space) and the sub-band 25.25-27 GHz is allocated to the standard frequency and time signal-satellite service (Earth-to-space), both on a secondary basis.

54. *Proposals.* In the *Notice*, the Commission noted that there are currently no FCC licensees using the secondary EESS allocation in the band 25.25-27.5 GHz and proposed to: (1) generally reflect changes previously made to the Federal Government Table in the *NTIA Manual*, including adopting a primary ISS allocation in that band and changing the directional indicator for the secondary EESS allocation in the sub-band 25.5-27 GHz from space-to-space to space-to-Earth; (2) correspondingly change the directional indicator for the secondary non-Federal Government EESS allocation in that sub-

<sup>111</sup> Lockheed Martin Comments at 17.

<sup>112</sup> Medtronic Comments at 4-5.

band; (3) upgrade the Federal Government EESS allocation in that sub-band to primary status; and (4) delete the remainder of the secondary EESS allocation (25.25-25.5 GHz and 27-27.5 GHz).<sup>113</sup>

55. *Comments.* DigitalGlobe, Inc. (“DigitalGlobe”) and Space Imaging, LLC (“Space Imaging”) express concern about the proposal in the *Notice* to upgrade from secondary to primary status only the Federal Government EESS allocation in the sub-band 25.5-27 GHz.<sup>114</sup> DigitalGlobe and Space Imaging contend that the non-Federal Government EESS allocation in that sub-band should also be upgraded to meet the requirements of the commercial remote sensing industry and to be consistent with the Fact Sheet on U.S. Commercial Remote Sensing Policy that was released by the White House on April 25, 2003.<sup>115</sup> This document states the fundamental goal of this policy is to “advance and protect U.S. national security and foreign policy interests by maintaining the nation’s leadership in remote sensing space activities, and by sustaining and enhancing the U.S. remote sensing industry;” and further states that U.S. companies are “encouraged to build and operate commercial remote sensing space systems whose operational capabilities, products and services are superior to any current or planned foreign commercial systems.”<sup>116</sup> DigitalGlobe and Space Imaging state that first generation commercial remote sensing satellite systems use the band 8025-8400 MHz, but this band has limitations for advanced commercial operations because the bandwidth is constrained – accordingly, the U.S. commercial remote sensing industry has identified the band 25.5-27 GHz for wider bandwidth operations.<sup>117</sup> DigitalGlobe states that the *Notice* provides no justification for why the latter band should be upgraded to primary only for Federal Government EESS users and not for commercial EESS users, and concludes that NTIA, in making its proposal to the Commission, simply overlooked commercial requirements.<sup>118</sup>

56. *Decision.* We are adopting the proposals pertaining to the band 25.25-27.5 GHz set forth in the *Notice*, except that we are maintaining, rather than deleting, the secondary non-Federal Government allocation for the EESS (space-to-space) in that band. We take the latter action to allow flexibility for both space-to-space and space-to-Earth operations by Federal and non-Federal Government users in that band. With respect to DigitalGlobe’s and Space Imaging’s concerns, we find that these two companies have presented evidence that the non-Federal Government, as well as the Federal Government, EESS allocation in the sub-band 25.5-27 GHz band should be upgraded to primary status, but we conclude that we have insufficient basis to upgrade that allocation at this time. The *Notice* did not propose to upgrade the non-Federal Government allocation, and – based on the limited record in this proceeding – we are unable to conclusively determine whether Federal Government fixed, mobile, ISS, and EESS users of the sub-band 25.5-27 GHz would be adversely affected by this upgrade. Accordingly, we decline to take that

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<sup>113</sup> *Notice* at 19786.

<sup>114</sup> See “Comments of DigitalGlobe, Inc.,” filed May 15, 2003, ET Docket No. 02-305, at 1-2; “Written *Ex Parte* Presentation in ET Docket No. 02-305; RM-10331,” filed by Space Imaging on June 24, 2003, at 1-2. DigitalGlobe also made an *ex parte* presentation to the Commission’s Office of Engineering and Technology on May 21, 2003. All three of these filings were received well after both the comment deadline of February 10, 2003 and the reply comment deadline of March 10, 2003 in this proceeding. In a Motion for Acceptance of Late-Filed Comments, filed on May 15, 2003, DigitalGlobe states that it was unaware until after the comment and reply comment deadlines had passed that this proceeding was relevant to its operations. We are herein accepting DigitalGlobe’s comments and have fully considered them and the *ex parte* presentations of DigitalGlobe and Space Imaging in arriving at the decisions set forth in this *Report and Order*.

<sup>115</sup> See Fact Sheet at <http://www.fas.org/irp/offdocs/nsdp/remsens.html>

<sup>116</sup> *Id.* at 2-3.

<sup>117</sup> DigitalGlobe Comments at 1-2; Space Imaging *Ex Parte* Presentation at 2-3.

<sup>118</sup> DigitalGlobe Comments at 11.

action at this time. However, we plan to explore in the WRC-03 implementation proceeding referenced in paragraph 33, *supra*, whether that change could be made without adversely impacting Federal Government users of that sub-band. In the interim, because non-Federal Government EESS providers will use that sub-band on a secondary basis to Federal Government users, it is incumbent that EESS applicants coordinate their proposed operations with NTIA in order to protect those users. Accordingly, we are adopting the changes for the band 25.25-27.5 GHz proposed in the *Notice*, except for maintaining the secondary non-Federal Government allocation for the EESS (space-to-space) in that band, as shown in Appendix B.

G. Other Allocation Issues

(1) Secondary AMS(R)S Allocation in the Band 136-137 MHz

57. *Background.* At WRC-97, the United States proposed to delete all secondary allocations from the band 136-137 MHz in order to make the band available exclusively to the aeronautical mobile (route) service ("AM(R)S") in an attempt to satisfy existing and future AM(R)S requirements.<sup>119</sup> In particular, the U.S. proposed that footnote 5.198 be modified to delete the secondary allocation for the aeronautical mobile-satellite (route) service ("AMS(R)S") from the band 136-137 MHz. The U.S. stated that there are no plans to implement AMS(R)S in the band 136-137 MHz. WRC-97 modified footnote 5.198 consistent with the U.S. proposals. Footnote US244 states that existing METSATS in this band may continue to operate on a not-to-interfere basis until January 1, 2002.

58. *Proposals.* The *Notice* proposed a footnote change in the U.S. Table in order to delete the unused AMS(R)S allocation from the band 136-137 MHz. In addition, the *Notice* proposed a footnote change to remove the expired transition plan for METSAT use of the band 136-137 MHz.<sup>120</sup>

59. *Decision.* No party commented on the proposals pertaining to the band 136-137 MHz set forth in the *Notice*. We are adopting these proposals, as shown in Appendix B. This action will bring the U.S. Table in the band 136-137 MHz into conformance with the band's use by the AM(R)S, remove the potentially conflicting AMS(R)S secondary allocation, and remove the expired transition plan for METSAT use of the band.

(2) The Band 420-450 MHz

60. *Background.* The band 420-450 MHz is allocated to the radiolocation service on a primary basis for Federal Government use and footnote G2 generally limits such operations to military applications.<sup>121</sup> Additionally, footnote US217 states that, along the shorelines of the contiguous 48 states and Alaska, pulse-ranging radiolocation systems in the band 420-450 MHz and spread spectrum radiolocation systems in the sub-band 420-435 MHz may be authorized for Federal and non-Federal Government use on a secondary basis, except for those systems located within the geographic areas listed in footnote US228.<sup>122</sup> The band 420-450 MHz is also allocated to the amateur service on a secondary basis; however, footnote US7 states that transmitters in the amateur service operating in that band in

<sup>119</sup> See U.S. WRC-97 Proposals at 66.

<sup>120</sup> Notice at 19787-88.

<sup>121</sup> See 47 C.F.R. § 2.106, footnote G2.

<sup>122</sup> See 47 C.F.R. § 2.106, footnotes US217, US228.



certain geographic areas are limited to 50 watts peak envelope power ("PEP") unless the Commission can reach an agreement with the applicable military frequency coordinator.<sup>123</sup>

61. *Proposals.* In the *Notice*, the Commission, in response to a request from NTIA on behalf of the U.S. Army, proposed to modify footnotes to the U.S. Table to more than double the combined size of the geographical area in Texas and New Mexico where the maximum transmitter power that amateur radio stations may use in the band 420-450 MHz would generally be limited to 50 watts PEP, rather than the usual limit of 1.5 kW PEP. In its request to the Commission, NTIA states that this geographical area must be extended to prevent interference from amateur radio operations to a New Mexico missile test range. NTIA cites Army concerns that amateur operations in this area present an interference threat to missiles launched at Fort Wingate, NM, aimed at the airspace over White Sands Missile Range, NM, because there is now a Department of Defense test and evaluation center that uses areas west and south of Albuquerque, NM.<sup>124</sup> Also in response to a request from NTIA, the Commission stated that it intended to place an informational footnote in its Rules pertaining to Federal Government wind profiler radar ("WPR") radiolocation use of the sub-band 448-450 MHz. Finally, the *Notice* requested comment on whether non-Federal Government WPRs should also be allowed in that sub-band on either a primary or secondary basis and on the impact of WPRs on non-Federal Government operations permitted in that sub-band.<sup>125</sup>

62. *Comments.* With respect to the Army's request, ARRL, the National Association for Amateur Radio ("ARRL") contends that the Army has not provided sufficient information to permit an evaluation of whether such a large area of restricted amateur radio operations is necessary. ARRL therefore requests that the Commission and NTIA cooperatively determine whether this area is overly broad. However, ARRL acknowledges that a 50 watt PEP power limitation is generally not burdensome on radio amateurs who use FM repeaters and digital communications techniques at 440-450 MHz. Rather, ARRL maintains, such a limitation would restrict principally those amateurs who experiment with weak-signal terrestrial communications and some satellite experimenters, as well as those involved with Earth-moon-Earth communications in the band 420-440 MHz. ARRL recommends that the Commission establish an expedited method of processing requests for such use in cases where amateurs are able to reach agreements with military area frequency coordinators.<sup>126</sup> Douglas L. Hanz, an amateur radio licensee, argues that the majority of military use of the band 420-450 MHz has been in the sub-band 420-430 MHz, and that use of this sub-band by amateurs has been very limited. However, Mr. Hanz contends, in the band 440-450 MHz, amateur station powers higher than 50 watts PEP can be authorized throughout Texas and New Mexico if those stations' antenna gains are limited. Mr. Hanz therefore proposes that amateur radio stations be permitted to use 110 watts PEP in that band with a restriction of 6dBi antenna gain, inclusive of transmission line loss.<sup>127</sup>

63. With respect to WPR use of the band 448-450 MHz, ARRL states that there is a substantial potential for WPRs to have an impact on amateur radio stations that use the 449 MHz center frequency for FM repeater operation on a secondary basis to the Federal Government radiolocation

<sup>123</sup> See 47 C.F.R. § 2.106, footnote US7. Sub-bands within the band 420-450 MHz are also allocated to the amateur-satellite, land mobile, and space operation services and for space telecommand and low power radio control operations.

<sup>124</sup> See Letter from Acting Associate Administrator, Office of Spectrum Management, NTIA to Chief, OET, FCC, dated August 8, 2002, Doc. 3256311.

<sup>125</sup> *Notice* at 19788-89.

<sup>126</sup> ARRL Comments at 4-6.

<sup>127</sup> Douglas L. Hanz Comments at 1.

service. ARRL concedes that use of the band 448-450 MHz by Federal Government WPRs is unavoidable, but requests that the Commission require siting coordination or notification in final rules for Federal Government WPRs. ARRL also asserts that there is no need to allow non-Federal Government WPRs to use this band because there is no support for such use.<sup>128</sup>

64. *Decision.* We are adopting the proposals pertaining to the band 420-450 MHz set forth in the *Notice*, as shown in Appendix B. With regard to the recommendation of ARRL, we note that our license processing procedures are not subject to rulemaking;<sup>129</sup> however, we always seek to process applications as expeditiously as possible. With regard to Mr. Hanz's concern, we observe that there already is a procedure by which amateur licensees can use powers greater than 50 watts; *i.e.*, by reaching agreement with a military area frequency coordinator. As indicated in NTIA's correspondence to us of August 2002, the Army finds that the area in Texas and New Mexico where amateur transmitter power in the band must be limited should be expanded to protect missile testing and evaluation at a test range in New Mexico. Accordingly, we are adopting our proposal to modify footnotes to the U.S. Table to expand the area in Texas and New Mexico where the maximum transmitter power that amateur radio stations may use in the band 420-450 MHz would generally be limited to 50 watts PEP. With regard to permitting non-Federal Government WPR use of the sub-band 448-450 MHz, only ARRL commented, and it is strongly opposed. Because no one expresses an interest in such non-Federal use, we will not permit non-Federal Government WPR use in the 448-450 MHz sub-band.

### (3) On-board Mobile Radiotelephony Communications

65. *Background.* In most of the world, the maritime mobile frequencies that may be used for maritime on-board mobile radiotelephony communications are listed in footnote 5.287.<sup>130</sup> However, in the territorial waters of the United States, some of the frequencies used for on-board communications differ from the frequencies used in the rest of the world.<sup>131</sup> At WRC-97, footnote 5.287 was revised to permit the use of equipment designed for 12.5 kHz channel spacing that could be used in U.S. territorial waters and other parts of the world. Such narrowband on-board mobile radiotelephony equipment may also use the following additional carrier frequencies: 457.5375 MHz, 457.5625 MHz, 467.5375 MHz, and 467.5625 MHz.<sup>132</sup>

66. *Proposals.* In the *Notice*, the Commission proposed to replace international footnote 669 with footnote 5.287 in the U.S. Table for the band 456-470 MHz. The effect of this proposal would be to

<sup>128</sup> ARRL Comments at 7-9.

<sup>129</sup> See 5 U.S.C. § 553(b)(3)(A).

<sup>130</sup> Footnote 5.287 reads as follows: "In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174 (see Resolution 341 (WRC-97))."

<sup>131</sup> Footnote 5.288 reads as follows: "In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174." See 47 C.F.R. § 80.373 (g), wherein these frequencies are listed in our Rules for private communications, limited to on-board communications.

<sup>132</sup> Previously, all on-board mobile radiotelephony equipment used 25 kHz channel spacing.

permit U.S. licensees to use maritime mobile equipment that is more spectrum-efficient and that has access to ten instead of six channels for on-board communications in areas outside U.S. territorial waters.<sup>133</sup>

67. *Decision.* No party commented on our proposal to replace international footnote 669 with footnote 5.287 in the U.S. Table for the band 456-470 MHz, thereby revising the frequency use provision for on-board mobile radiotelephony maritime communications. Accordingly we are adopting this proposal, as shown in Appendix B. This action will permit more efficient maritime mobile equipment to be employed outside U.S. territorial waters.

(4) IFPRS Use in the Bands 2.1-2.2 GHz and 10.7-11.7 GHz

68. *Background.* The International Fixed Public Radiocommunication Services ("IFPRS") were the original means by which international telephone calls were completed. However, the IFPRS have atrophied as first overseas voice cables, then FSS links, and now fiber optic cables have essentially replaced radio for international calling. Footnotes NG23 and NG41 state that frequencies in the band 2100-2200 MHz and in the bands 3700-4200 MHz, 5925-6425 MHz, and 10.7-11.7 GHz, respectively, may be used for IFPRS communications.<sup>134</sup> However, only the bands 3700-4200 MHz and 5925-6425 MHz ("C-band") are currently in use for IFPRS, and those bands are used by only three licensees on Caribbean islands.

69. *Proposals.* In the *Notice*, the Commission, in order to remove regulations that are no longer needed, proposed to delete footnote NG23, which pertains to the band 2100-2200 MHz, and to revise footnote NG41 to remove the band 10.7-11.7 GHz because there are no longer any IFPRS licensees operating in either of these bands. The Commission also proposed to delete all cross-references to Part 23, except for C-band, from column 6 of the Table of Frequency Allocations.<sup>135</sup>

70. *Comments.* Only PanAmSat Corporation ("PanAmSat") commented on our proposal to reduce the spectrum allocated for the IFPRS. PanAmSat supports elimination of the unused IFPRS allocations in the bands 2100-2200 MHz and 10.7-11.7 GHz, and also recommends that, in C-band, we prohibit new IFPRS facilities. PanAmSat states that, given the antiquated nature of the IFPRS, there is no need for additional such systems in the C-band and recommends that the few existing systems in the Caribbean islands be grandfathered.<sup>136</sup>

71. *Decision.* We are adopting the proposals pertaining to the IFPRS set forth in the *Notice*, as shown in Appendix B, but are rejecting PanAmSat's recommendation to prohibit new C-band IFPRS facilities. There is no opposition to the proposals relating to the IFPRS; however, PanAmSat recommends that we take additional action. While we concur with PanAmSat that new IFPRS facilities are unlikely to be required in C-band, we do not want to foreclose the opportunity for additional use of this service in remote island areas if it is required. Further, we have not given interested parties sufficient notice in this proceeding to prohibit such facilities.<sup>137</sup> Additionally, there would be no significant administrative advantage of such a prohibition, as C-band IFPRS rules must be retained for existing facilities. Accordingly, we deny PanAmSat's request.

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<sup>133</sup> *Notice* at 19790.

<sup>134</sup> See 47 C.F.R. 2.106, footnotes NG23 and NG41.

<sup>135</sup> *Notice* at 19790.

<sup>136</sup> PanAmSat Comments at 2.

<sup>137</sup> See 5 U.S.C. § 553(b).

## (5) Secondary MSS Use of the band 14-14.5 GHz

72. *Background.* The band 14-14.5 GHz is allocated for FSS uplinks on a primary basis for non-Federal Government use. This band is heavily used by Very Small Aperture Terminals ("VSATs") for uplinking to geostationary satellites.<sup>138</sup> These VSAT systems provide video and data communications and are widely deployed at business locations, ranging from the largest corporate headquarters to the smallest convenience stores. In 2001, the Commission authorized NGSO FSS gateway and user terminal uplinks to operate in the band 14-14.5 GHz.<sup>139</sup> The band 14-14.5 GHz is also allocated for Land Mobile Satellite Service ("LMSS") uplinks on a secondary basis for non-Federal Government use. This LMSS allocation is used by OmniTracs, a satellite-based mobile communications and tracking system that provides real-time messaging and position reporting between fleets and their operations centers.<sup>140</sup>

73. The sub-band 14-14.2 GHz is allocated to the radionavigation service on a primary basis for Federal and non-Federal Government use; however, stations in that service operate on a secondary basis to FSS uplinks.<sup>141</sup> The sub-band 14-14.2 GHz is also allocated to the SRS on a secondary basis for Federal and non-Federal Government use. In addition, the sub-band 14.2-14.4 GHz is allocated to the mobile except aeronautical mobile service on a secondary basis for non-Federal Government use. The Commission has made this spectrum available for assignment to television pickup and television non-broadcast pickup stations in the Local Television Transmission Service.<sup>142</sup> The sub-band 14.4-14.5 GHz is allocated to the fixed and mobile services on a secondary basis for Federal Government use. Finally, footnote US203 states that radio astronomy observations of the formaldehyde line frequencies 14.47-14.5 GHz may be made at certain observatories.<sup>143</sup>

74. *Proposals.* In the *Notice*, the Commission observed that LMSS operates on the band 14-14.5 GHz in the United States on a secondary basis without causing harmful interference to ubiquitously deployed VSATs and that other nations have implemented MMSS uplinks in the band 14-14.5 GHz on a secondary basis. The Commission also observed that it agreed with the *U.S. WRC-97 Proposals* that using the same or similar terminals to offer MMSS services in the band 14-14.5 GHz should be compatible with other services in this band, especially since the LMSS allocation has been successfully used in the United States for some time. Accordingly, the Commission proposed in the *Notice* to allocate the band 14-14.5 GHz to the MSS (Earth-to-space) except AMSS on a secondary basis for non-Federal Government use.<sup>144</sup>

<sup>138</sup> Our database indicates that there are 2672 authorizations issued for GSO FSS earth stations in the 14-14.5 GHz band. The authorizations do not indicate the actual number of earth stations or antennas that a licensee might deploy. For example, since this is a VSAT band, a single GSO FSS authorization could cover several hundred VSAT antennas.

<sup>139</sup> See *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, ET Docket No. 98-206, *First Report and Order and Further Notice of Proposed Rule Making*, 16 FCC Rcd 4096 (2001).

<sup>140</sup> Qualcomm's OmniTracs service processes more than six million transactions each day sent to and from a quarter-million trucks. See *Qualcomm Service Keeps on Trucking*, July 13, 2001 at <http://www.business2.com/articles/web/print/0,1650,16490,FF.html>.

<sup>141</sup> See 47 C.F.R. § 2.106, footnote US292.

<sup>142</sup> See 47 C.F.R. Part 101, Subpart J. Our licensing database shows 24 Local Television Transmission, 1 TV pickup, 1 Industrial/ Business Pool, 1 point-to-point microwave, and 2 land mobile radiolocation records for the band 14.2-14.4 GHz.

<sup>143</sup> See 47 C.F.R. § 2.106, footnote US203.

<sup>144</sup> *Notice* at 19791.

75. *Comments.* Boeing and PanAmSat generally support allocating the band 14-14.5 GHz to the MSS on a secondary basis. However, Boeing recommends that the prohibition against secondary AMSS use be reconsidered and PanAmSat urges the Commission to clarify that MMSS use of this band is contemplated solely as an adjunct to FSS.<sup>145</sup> Boeing contends that, pursuant to Resolution 216 (Rev.WRC-2000) and Agenda Item 1.11 of WRC-03, domestic and international study groups have determined that appropriately designed AMSS systems can operate on a secondary basis in the band 14-14.5 GHz without causing harmful interference to other authorized services. Accordingly, Boeing states, the United States is submitting a proposal to WRC-03 to remove the prohibition on AMSS, thus permitting all forms of MSS to be provided in this band.<sup>146</sup> PanAmSat contends that it would be impractical and a waste of valuable FSS spectrum to license the band 14-14.5 GHz for stand-alone MMSS, given that the primary use of the band necessarily must remain for FSS facilities.<sup>147</sup>

76. *Décision.* We are allocating the band 14-14.5 GHz to the MSS, including AMSS (Earth-to-space), for non-Federal Government use on a secondary basis, as set forth in the new Rules in Appendix B. There is no opposition to this allocation. Consistent with the comments of Boeing regarding AMSS, we believe that such use of the band appears to be technically feasible and would be helpful in meeting the growing demand for two-way broadband data and communications capabilities for commercial aircraft passengers and crew. Further, WRC-03 added a worldwide secondary AMSS allocation in this band.<sup>148</sup> We find that conforming the US Table to this recent international allocation is desirable because it will facilitate an important new use of the 14-14.5 GHz band on a non-interference basis to other uses of the band. We further find that no party need be adversely impacted by this action. However, we note that the SRS has a secondary allocation in a portion of this band and NASA uses that allocation as a downlink for its Tracking and Data Relay Satellite System ("TDRSS"). Further, the National Science Foundation ("NSF") operates radio astronomy services ("RAS") in the band 14.47-14.50 GHz in accordance with footnote US203 and Radio Astronomy is allocated on a secondary basis internationally. Therefore, users of AMSS will need to deal with protection of radio astronomy. We also note that a number of administrations have specified specific protection requirements for radio astronomy. In December 2001, we issued Boeing a license to operate mobile earth stations aboard aircraft in the 14-14.5 GHz band and imposed several conditions on that license, including the conditions that Boeing not constrain deployment of additional government stations operated by NASA in the SRS and that Boeing design and operate its system in accordance with its Technical Operational Coordination Agreement with NSF to facilitate the protection of RAS.<sup>149</sup> Boeing must continue to operate in accordance with the conditions that we imposed on its license and thus must continue to protect the TDRSS and RAS operations in the 14-14.5 GHz band. Further, in accordance with a Memorandum of Understanding ("MOU") that we reached with NTIA in July 2002, we will protect those operations from interference by any future AMSS operations that we authorize in that band. Until we adopt final rules relating to allocation changes in the 14-14.5 GHz band or licensing of AMSS terminals in that band, we will place the following conditions on any additional system authorizations that we may issue in that band for a service similar to Boeing's:

<sup>145</sup> Boeing Comments at 12; PanAmSat Comments at 3.

<sup>146</sup> Boeing Comments at 12.

<sup>147</sup> PanAmSat Comments at 3.

<sup>148</sup> See *WRC-03 Provisional Final Acts* at 34-38. These pages show a new "Mobile-satellite (Earth-to-space)" allocation in this band in all three Regions, as well as new footnote 5.AA13, which reads: "In the band 14-14.5 GHz, aircraft earth stations in the secondary aeronautical mobile-satellite service may also communicate with space stations in the fixed-satellite service. The provisions of Nos. 5.29, 5.30 and 5.31 apply."

<sup>149</sup> See *The Boeing Company*, Order and Authorization, DA 01-3008 (released December 21, 2001).

- (1) The system shall be designed and operated so as not to cause harmful interference to TDRSS or RAS operations in the United States; and
- (2) The system shall not constrain future deployment of additional Federal Earth Stations in the SRS and RAS authorized pursuant to existing allocations.<sup>150</sup>

Because RAS operations in the band 14.47-14.5 GHz operate on an unprotected basis domestically, we will maintain the protection of RAS as articulated in the conditions specified above. However, we note that the Commission may explore in a future rulemaking the protection levels or mechanism necessary to protect these services. The NTIA/FCC MOU states that “[t]he FCC will endeavor to reflect in its decisions conditions and constraints that explicitly protect NASA, NSF and other government operations (i.e., ITU-R Recommendation RA. 769 for Radio Astronomy and ITU-R Recommendations SA. 5.10, S.A. 1017, S.A. 1155, SA. 1414, M. AMSS for TDRSS earth stations, and Boeing’s Technical Operational Coordination Agreement with NSF, dated 13 December 2001, and the letter of guidance provided to Boeing by NASA, dated December 178, 2001.”<sup>151</sup>

77. Lastly, as noted in paragraph 73, *supra*, Government fixed and mobile services are allocated on a secondary basis in the band 14.4-14.5 GHz. Protection criteria for these Government terrestrial operations may need to be developed in conjunction with AMSS service rules in the 14-14.5 GHz band.

78. Accordingly, we are allocating the 14-14.5 GHz band to all MSS uses on a secondary basis to the primary FSS in that band, as well as on a secondary basis to the primary radionavigation service in the 14-14.2 GHz sub-band.<sup>152</sup> Finally, with regard to PanAmSat’s concern about MMSS, we observe that such use of the band 14-14.5 GHz – like other MSS use of this band – will be on a secondary basis to FSS, and we find no need to further restrict how MMSS should operate in the band.

#### H. Ministerial Amendments

79. *Proposals.* In the *Notice*, the Commission proposed to make a number of ministerial amendments to Part 2 of the Commission’s Rules. First, to eliminate both confusion and outdated provisions, the Commission proposed to:

- (1) replace international footnotes 599A, 608A, 608B, and 647B in the “Little LEO”<sup>153</sup> bands of the U.S. Table with footnotes 5.208, 5.219, 5.220, and 5.264, respectively, which are non-substantive changes;

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<sup>150</sup> See “Memorandum of Understanding Between the Federal Communications Commission and the National Telecommunications and Information Administration Addressing the Aeronautical Mobile-Satellite Service In the 14.0-14.5 GHz Band,” July 8, 2002, at 2.

<sup>151</sup> *Id.*

<sup>152</sup> We note that Appendix B lists the international footnotes pertaining to the 14-14.5 GHz band that were adopted at WRC-03.

<sup>153</sup> Little LEOs is the common name for Non-Voice Non-Geostationary MSS systems, which operate below 1 GHz. Little LEO downlink spectrum is allocated on a primary basis in the bands 137-137.025 MHz, 137.175-137.825 MHz, and 400.15-401 MHz, and on a secondary basis in the bands 137.025-137.175 MHz and 137.825-138 MHz. Little LEO uplink spectrum is allocated on a primary basis in the bands 148-150.05 MHz and 399.9-400.05 MHz.

(2) merge footnote US322 into US320, that is, add the bands 149.9-150.05 MHz and 399.9-400.05 MHz to footnote US320, and delete superfluous footnotes US322 and 599B from the U.S. Table;

(3) delete expired footnote US318 from the band 137-138 MHz and the Part 25 cross reference from the band 136-137 MHz; and

(4) delete expired text from section 25.202(a)(3), which concerns the allocation status of certain of the Little LEO bands.<sup>154</sup>

80. Second, the Commission observed that, in WT Docket No. 01-289, it proposed to delete the Civil Air Patrol ("CAP") from Part 87 of the Rules because the Commission has no formal relationship with the CAP, which is authorized by the U.S. Air Force and NTIA.<sup>155</sup> To be consistent with that proposal, in the *Notice* the Commission proposed to delete footnote US10, which states that several frequencies in the band 138-144 MHz are available for use by the CAP.<sup>156</sup>

81. Third, the Commission proposed to delete international footnote 510 from the band 144-146 MHz in the non-Federal Government Table. This footnote, through its reference of Resolution 640, invited administrations to provide for the needs of international disaster communications and for the needs of emergency communications using certain amateur bands.<sup>157</sup>

82. Fourth, the Commission proposed to revise footnote US48 to remove provisions regarding the band 5350-5460 MHz that are already provided elsewhere in the Table. That is, there is already a primary direct Table allocation for Federal Government radiolocation and a secondary direct Table allocation for non-Federal Government radiolocation in the band 5350-5460 MHz for this purpose.<sup>158</sup>

83. Fifth, the Commission proposed to revise footnote US110 to remove provisions regarding certain bands that are already shown in the Table. That is, there are primary direct Table allocations for Federal Government radiolocation and secondary direct Table allocations for non-Federal Government radiolocation in all of the bands listed in footnote US110, except for the band 9200-9300 MHz, which is allocated to both the Federal and non-Federal Government radiolocation service on a secondary basis.<sup>159</sup>

84. Sixth, the Commission proposed to revise footnote US310 to specify the pfd limits for all angles of arrival. Currently US310 specifies only the maximum and minimum pfd limits and references CCIR Recommendation 510-1, which has been renumbered as Recommendation ITU-R SA.510-2, for the specific requirements.<sup>160</sup>

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<sup>154</sup> *Notice* at 19792.

<sup>155</sup> See *Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service*, WT Docket No. 01-289, *Notice of Proposed Rule Making*, 16 FCC Rcd 19,005 at ¶ 35.

<sup>156</sup> *Notice* at 19792.

<sup>157</sup> *Id.*

<sup>158</sup> *Id.*

<sup>159</sup> *Id.* at 19793.

<sup>160</sup> *Id.*

85. Seventh, the Commission proposed to add a reference to footnote NG167 in the band 17.3-17.7 GHz to explicitly tie the allocation for the broadcasting-satellite service in the band 17.3-17.7 GHz to its feeder link allocation in the band 24.75-25.25 GHz.<sup>161</sup>

86. Eighth, the Commission proposed to make the following changes to the rule part cross-references in column 6 of the Table of Frequency Allocations:

- (1) delete Part 87, the Aviation Services, from the band 29.8-30 MHz and add Part 87 to the bands 72-73 MHz, 74.6-74.8 MHz, and 156.2475-157.0375 MHz;
- (2) add Part 90, the Private Land Mobile Radio Services, to the band 410-420 MHz;
- (3) add Part 80, the Maritime Services, to the band 1525-1535 MHz; and
- (4) add Part 25, Satellite Communications, to the band 1660-1660.5 MHz.<sup>162</sup>

87. Ninth, the Commission proposed to make the following changes to eliminate outdated requirements or correct typographical errors:

- (1) clarify in footnote US217 that spread spectrum radiolocation systems may be authorized for Federal and non-Federal Government use in the sub-band 420-435 MHz within Alaska and the contiguous 48 states and correct several typographical errors;
- (2) correct a typographical error in footnote US316 by changing the NEXRAD expansion band from 2900-3100 MHz to 2900-3000 MHz;
- (3) delete the references to footnote NG30 in the band 806-894 MHz and to footnote NG43 in the band 806-849 MHz from the non-Federal Government Table because these footnotes have previously been deleted, but were not fully removed from the non-Federal Government Table;
- (4) delete footnote NG63 because the Commission's licensing files show that there are no television broadcast translator stations still authorized to operate in the band 806-890 MHz (old TV channels 70-83); and
- (5) delete footnote US54 because Federal Government radiolocation systems that could cause harmful interference to ARNS have had at least since 1961 to move to other frequency bands.<sup>163</sup>

88. Tenth, the Commission proposed to replace the reference to international footnote 5.149 with footnote US342 in the U.S. Table for several frequency bands and proposed to add two additional bands to the text of that footnote. In addition, it proposed to delete footnote 5.149 from the band 1660.5-1668.4 MHz, and proposed to revise US342 by deleting the indication showing which frequency bands are used for spectral line observations. The Commission also requested comment on whether US342 could be revised to state that licensees are "urged," (similar to footnote 5.149) instead of "required" to take all practicable steps to protect the radio astronomy service ("RAS") from harmful interference.<sup>164</sup>

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<sup>161</sup> *Id.*

<sup>162</sup> *Id.*

<sup>163</sup> *Id.* at 19793-94.

<sup>164</sup> *Id.* at 19794.



89. Finally, the Commission observed that the band 73-74.6 MHz is allocated exclusively to the RAS, which is a passive service, and that passive bands are listed in footnote US246. Accordingly, it proposed to add the band 73-74.6 MHz to US246.<sup>165</sup>

90. *Decision.* No party commented on any of the proposals pertaining to ministerial amendments to Part 2 of the Commission's Rules set forth in the *Notice*. We are adopting these proposals, as shown in Appendix B, to enhance the accuracy of the U. S. Table. In addition, on our own motion, we are making nine additional ministerial changes. We are merging the bands 698-746 MHz and 746-764 MHz as the band 698-764 MHz because the allocations in these bands are exactly the same and thus, this action simplifies our Table. We are deleting the band 34.2-34.7 GHz from footnote US252 because the SRS allocation for this band has been made a direct Table allocation.<sup>166</sup> We are deleting the obsolete list of coordinated observatories from footnote US277 and are instead cross referencing the list of observatories in footnote US355.<sup>167</sup> We are correcting footnote US355 in order to use the proper symbols for degree, minute, and second.<sup>168</sup> We remove the "S" reference in footnote US303 to make the cross-reference to ITU Radio Regulation No. 21.16 consistent with current practice. We are updating footnote NG114 to refer to the Public Mobile Service, not the Domestic Public Service, which no longer exists.<sup>169</sup> At the request of NTIA, we are adding footnote 5.391, which prohibits high-density mobile systems, to the band 2200-2290 MHz, which is Federal Government exclusive band.<sup>170</sup> We are adding cross reference to the Aviation Services (Part 87) in the bands 2310-2320 MHz and 2345-2385 MHz. We also remove those footnotes to the Table of Frequency Allocations that are no longer in effect because they have been suppressed in the ITU *Radio Regulations*. These additional ministerial actions will update and otherwise remove errors from the U.S. Table.

#### FINAL REGULATORY FLEXIBILITY CERTIFICATION

91. The Regulatory Flexibility Act of 1980, as amended ("RFA"),<sup>171</sup> requires that a final regulatory analysis be prepared for notice-and-comment rule making proceedings, unless the agency certifies that the "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."<sup>172</sup> The RFA generally defines the term "small entity" as having the same

<sup>165</sup> *Id.* at 19795.

<sup>166</sup> 47 C.F.R. § 2.106, footnote US252; *see* ¶ 50, *supra*.

<sup>167</sup> 47 C.F.R. § 2.106, footnote US277.

<sup>168</sup> 47 C.F.R. § 2.106, footnote US355.

<sup>169</sup> Footnote NG114 states that, in the Gulf of Mexico offshore from the Louisiana-Texas coast, the band 476-494 MHz (TV channels 15, 16 and 17) is allocated to the Domestic Public and Private Land Mobile Radio Services in accordance with the regulations set forth in Parts 22 and 90, respectively. 47 C.F.R. § 2.106, footnote NG114. However, it is the service rules for the Public Mobile Services that are codified in 47 C.F.R. Part 22 and the particular use described in footnote NG114 is codified at 47 C.F.R. Part 22, Subpart I, which is the Offshore Radiotelephone Service.

<sup>170</sup> Footnote 5.391 reads as follows: "In making assignments to the mobile service in the bands 2025-2110 MHz and 2200-2290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take that Recommendation into account for the introduction of any other type of mobile system." Footnote 5.391 has previously been added to the band 2025-2110 MHz in both the Federal and non-Federal Government Tables.

<sup>171</sup> *See* U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 -612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. Law No. 104-121, Title II, 110 Stat. 857 (1996).

<sup>172</sup> 5 U.S.C. § 605(b).

meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”<sup>173</sup> In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.<sup>174</sup> A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (“SBA”).<sup>175</sup>

92. This Report and Order amends Parts 2, 25, and 87 of our Rules in order to implement domestically various allocation decisions from several World Radiocommunication Conferences concerning the frequency bands between 28 MHz and 36 GHz and to otherwise update our Rules in this frequency range. These allocations mainly affect Federal agencies.<sup>176</sup> Those allocations that are most significant to non-Federal Government operations are: (1) implementing generic L-band MSS allocations; (2) allocating the band 1164-1189 MHz to the RNSS; and (3) deleting unused and limited FSS and BSS allocations from the band 2500-2690 MHz. Concerning L-band MSS, currently there is only one U.S. licensee. Concerning the RNSS allocation, only one or at most a few large companies are expected to be able to launch and maintain RNSS systems, which are expensive. The last action merely deletes unused allocations, with no direct effect on licensees or regulatees.

93. We have determined that the rules adopted in this R&O will not have a significant economic impact on a substantial number of small entities. Accordingly, we hereby certify that this R&O will not have a significant economic impact on a substantial number of small entities. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this R&O, including this certification, to the Chief Counsel for Advocacy of the Small Business Administration.<sup>177</sup> A copy will also be published in the Federal Register.<sup>178</sup>

#### ORDERING CLAUSES

94. Accordingly, IT IS ORDERED that pursuant to Sections 1, 4, 301, 302(a), 303, 307, 309, 316, 332, 334, and 336 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154, 301, 302(a), 303, 307, 309, 316, 332, 334, and 336, the Report and Order and the rules specified in Appendix B ARE ADOPTED.

95. IT IS FURTHER ORDERED that the late-filed comments of DigitalGlobe, Inc. to the *Notice of Proposed Rule Making* in this proceeding ARE ACCEPTED.

96. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

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<sup>173</sup> 5 U.S.C. § 601(6).

<sup>174</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

<sup>175</sup> 15 U.S.C. § 632.

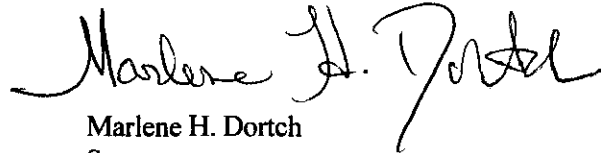
<sup>176</sup> See ¶¶ 5-6, *supra*.

<sup>177</sup> 5 U.S.C. § 605(b).

<sup>178</sup> *Id.*

97. IT IS FURTHER ORDERED that this proceeding IS TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

A handwritten signature in black ink, appearing to read "Marlene H. Dortch". The signature is fluid and cursive, with the first name "Marlene" being the most prominent part.

Marlene H. Dortch  
Secretary